OSTM / Jason-2

Near Real-Time Data Annual Quality Report 2010-2011

August 2011

Prepared by:

U.S. Department of Commerce
National Oceanic and Atmospheric Administration (NOAA)
National Environmental Satellite, Data, and Information Service (NESDIS)
Center for Satellite Applications and Research (STAR)

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eApproval Page
(Approval for Re-release)

Document Numbers:

NOAA/NESDIS Polar Series/OSTM J442	Near Real-Time Data Annual Quality Report 2010-2011 NOAA-Jason2/OSD-2013-0003R0 August 12, 2011

Document Title Block:

OSTM / Jason-2

Near Real-Time Data Annual Quality Report 2010-2011

PROGRAM: OSTM / Jason-2	**DOCUMENT RE-RELEASE DATE**: August 28, 2013
APPROVALS	
GROUP: Center for Satellite Applications and Research (STAR) Approved by email on August 28, 2013. NAME: Laury Miller, Program Scientist	GROUP: Office of Systems Development (OSD) Approved by email on August 28, 2013. NAME: Walid Bannoura, Project Manager
INITIAL RELEASE APPROVAL: Approved on August 12, 2011. NAME: John Lillibridge, OSTM Project Scientist	

Version Description Record

DOCUMENT TITLE:
OSTM / Jason-2 Near Real-Time Data Annual Quality Report 2010-2011

DOCUMENT CHANGE HISTORY		
Revision	Date	Description of Change
R0	August 12, 2011	Initial Release
-	August 20, 2013	Reformatted (no change to content)

Preface

This document comprises the initial National Oceanic and Atmospheric Administration (NOAA) National Environmental Satellite, Data, and Information Service (NESDIS) baseline publication of the OSTM / Jason-2 *Near Real-Time Data Annual Quality Report 2010-2011* (August 12, 2011 issue).

The purpose of this document is to assess the overall quality of the Jason-2/OSTM near real-time products, Operational Geophysical Data Records (OGDRs), which are produced by NOAA and EUMETSAT. For each 10-day cycle, five primary parameters are displayed, divided into ascending and descending passes: sea surface height, significant wave height, ocean surface wind speed, altimeter-based ionosphere correction, and radiometer-based wet troposphere correction. All anomalies evident in these plots, such as orbital maneuvers or data gaps from calibration exercises, are described and documented based upon operational processing logs, etc. Statistics for data latency and data return are presented to demonstrate that high-level mission requirements have been met.

Future updates and revisions to this document will be produced and controlled by NOAA/NESDIS.

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Section 1.0 Introduction

The Jason-2/Ocean Surface Topography Mission is the successor to the Topex/Poseidon and Jason-1 radar altimetry missions. Jason-2 was launched from Vandenberg AFB on 20-Jun-2008, and the onboard instruments began producing data shortly thereafter, on 22-Jun-2008. Prior to achieving its final ~10-day exact repeat orbit, Jason-2 executed a series of maneuvers after injection into orbit. The exact repeat orbit was finally achieved on 04-Jul-2008. Since this resulted in a partial 10-day cycle, it was dubbed cycle-0. All subsequent cycles (beginning with cycle-1) are comprised of 254 half-revolution ‘passes’ with odd-numbered ascending passes extending from south to north, and even-numbered descending passes going north to south.

The primary instrument on-board Jason-2 is a dual-frequency radar altimeter (Ku-band & C-band) that provides measurements of sea surface height, significant wave height, and ocean surface wind speed. Three independent orbit determination systems are provided by the DORIS, GPSP, and passive laser retro-reflector instruments. Sea surface height is computed from the difference in orbital altitude from these systems and the fundamental range measurement (from round-trip travel time) made by the altimeter. Finally, a three-frequency passive microwave radiometer provides measurements of integrated total precipitable water, which is used to correct the sea surface height measurements for path delays due to atmospheric water vapor. Path delay corrections for the ionosphere are based on the dual-frequency altimeter measurements, and for the dry troposphere based on ECMWF model surface pressure fields. Finally, sea surface heights are corrected for signals not associated with large-scale ocean circulation (tides, inverse barometer, and sea state bias).

The Ocean Surface Topography Mission is a four-partner collaboration between NOAA, NASA, CNES and EUMETSAT. As partner operational agencies, NOAA and EUMETSAT share responsibility for production of near real-time data sets. These data, the Operational Geophysical Data Records (OGDRs) are the focus of this quality assessment report. OGDRs are typically produced 1-3 hours after the telemetry are received from the spacecraft, leading to nominal data latencies of 3-5 hours after accounting for two hours of data acquisition on board between data dumps to the ground. The data latency statistics over the third year of mission operations are discussed in the next section.

Section 2.0 Data Latency Statistics

The four project partners hold Operational Coordination Group (OCG) meetings weekly, and NOAA routinely reports statistics for near real-time product latency. The latency is computed for each OGDR, based on the time difference between the data itself (measurement time) and the time of availability of the product to end users. The calculation is performed for both the 3 hour / 75% requirement and 5 hour / 95% requirement. The overall latency of the OGDRs, produced by both NOAA and EUMETSAT, is accumulated over the previous week for reporting at the OCG meeting.

Figure 1 is a graphical representation of the weekly latency statistics over the third year of operations. At each weekly interval along the x-axis, the percentage of data available within 3 hours is shown by the height of the green area (on a y-axis scale of 60-100%). The percentage of data available within 5 hours is shown by the height of the combined green + yellow areas. Finally, the red areas show the percentage of data NOT available within 5 hours, as a difference between 100% and the yellow area. The target 75% and 95% requirements are shown as horizontal dashed lines.

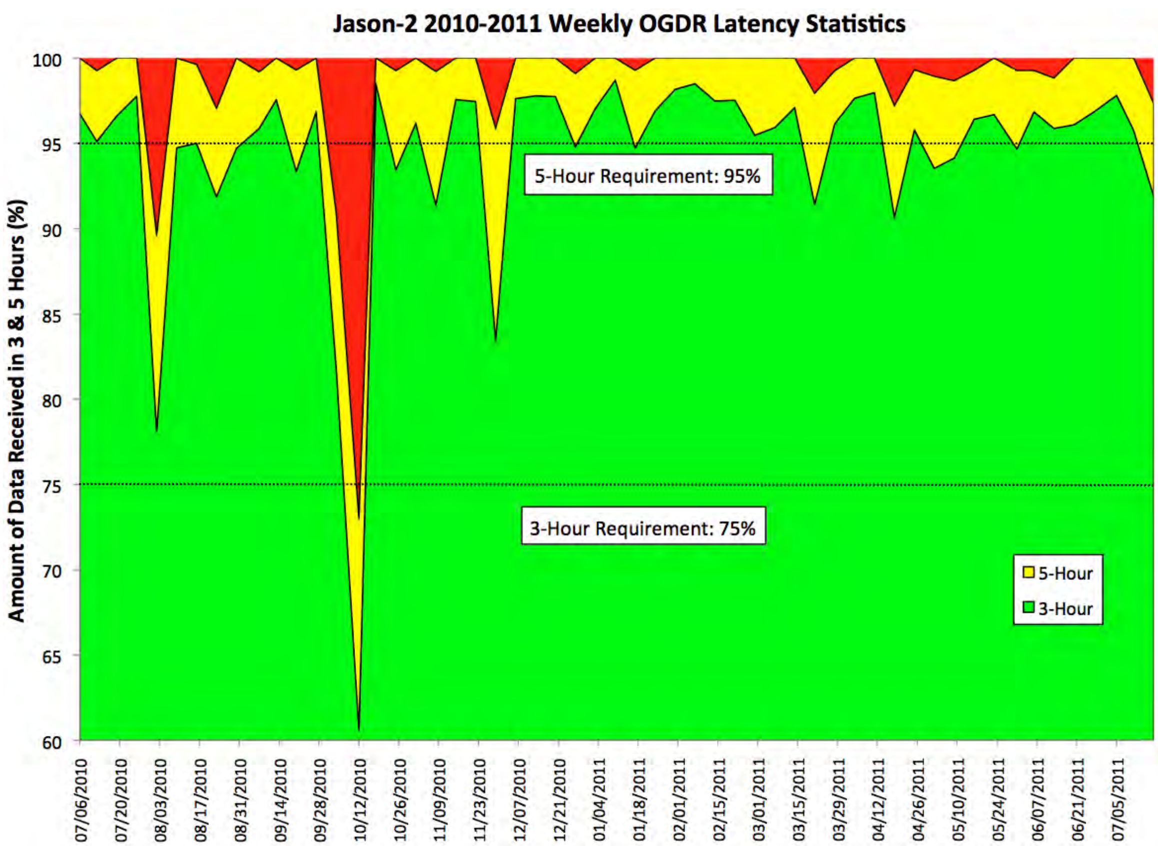


Figure 1 – Jason-2 OGDR Latency Statistics for July 2010 to July 2011

This figure demonstrates that the 3-hour requirement was satisfied for all weeks except the one ending 12-Oct-2010. This was due to the annual preventive maintenance done at the Usingen ground station. During that week many passes could not be scheduled at Usingen, leading to frequent ‘blind passes’ resulting in greater than normal latency. The 5-hour requirement was also not met that week, as well as during the week ending 03-Aug-2010. There were hardware issues with a high-power amplifier at the Usingen station that week, resulting in missed passes for several days. The problem was finally eliminated when the defective part was replaced. **The yearly averaged values (over the 55 weeks shown in Figure 1) are: 94.49% of all data were available within 3 hours and 98.65% of all data were available within 5 hours.**

Section 3.0 Data Quality Analysis Plots

In this section data from the third year of operations are analyzed, covering the time period from 05-Jul-2010 to 07-Jul-2011: cycles 74-110. We focus the analysis on five primary geophysical parameters measured by the on-board instruments: sea surface height anomaly (relative to a multi-year altimetric mean sea surface), significant wave height, ocean surface wind speed, wet tropospheric path delay (from the radiometer), and ionospheric path delay based on dual-frequency altimeter measurements.

Each of the five geophysical parameters are analyzed on a per-cycle basis, with data from ascending and descending portions of the ground track plotted separately to prevent overlapping points. The start and end times of each cycle are based on an average cycle duration of 9d 21h 58m 31.612s (856711.612 seconds). The start and end times in the plot labels are rounded to the nearest second, and agree within ± 2 seconds with the actual cycle boundaries. The individual 1-second data points, read from the NetCDF formatted OGDR files, are filtered with a 20-second long median filter and values are reported every 10-seconds along track. Each of these 10-second values is plotted as a filled circle, color coded by a rainbow scale based on a prescribed maximum-minimum range for that variable. For each ~10-day cycle, the five parameters are plotted on a single page as ten subplots (separate ascending/descending data) in Appendix-A. Each cyclic subplot represents a map view of a single variable, over the region 22°-382° longitude, ± 70° latitude. The longitude axis is offset by 22° to split the plots at Cape Agulhas, where there is minimal oceanic latitudinal extent between the Atlantic & Indian basins.

Plots for cycles 74-110, comprising the third year of operations for Jason-2, are contained in Appendix-A. These plots provide an excellent means of assessing the overall data coverage (or data gaps) as well as anomalies in the data values of the five analyzed parameters. If a parameter map has long stretches of data that are ‘off-scale’ in either the positive (red) or negative (blue) directions, there is a clear indication of degraded quality. These 37 plots form the basis of the quality assessment provided in the following sections.

Section 4.0 Anomalies Impacting Quality

Since the launch of Jason-2 a variety of anomalies have occurred which impact the quality of the data. These can be related to spacecraft maneuvers, instrumental problems, telemetry transmission difficulties, ground station anomalies, or data processing errors. The anomalies impacting data quality from July 2010 to July 2011 are as follows:

a. **Spacecraft maneuvers** - When maneuvers are performed the accuracy of the orbital information is degraded, leading to larger than normal once-per-revolution radial orbit error. This causes long wavelength errors in sea surface height anomaly, but has little impact on the other parameters. The spacecraft's attitude can also be affected, but the ground-based retracking of the radar return 'waveform' normally compensates for off-nadir excursions and there is minimal degradation of any of the measured parameters.

Four cycles were affected by maneuvers this year:

Cycle-076: A maneuver burn was performed on 2010-07-25 from 22:02:27 to 22:02:28, affecting pass 005. The impact of this maneuver was small enough to not be noticeable in the plot in Appendix A. The affected OGDR is:

JA2_OPN_2PcS076_003_20100725_201727_20100725_221343

Cycle-086: A maneuver burn was performed on 2010-11-05 from 01:00:06 to 01:00:08, affecting pass 081. The impact of this maneuver can be seen in the central N. Pacific in the descending Cycle-086 plot in Appendix A. The affected OGDR is:

JA2_OPN_2PcS086_079_20101104_231541_20101105_011057

Cycle-106: A station keeping maneuver was performed on 2011-05-26 between 08:04:37 and 08:04:38, resulting in a degraded OGDR between 06:19:44 and 09:00:02, passes 181-184. The affected OGDR is:

JA2_OPN_2PcS106_181_20110526_061944_20110526_090002

The regions of large orbit error can be seen in the Pacific ocean in the Cycle-106 descending plot in Appendix A.

Cycle-110: A gyro calibration was performed on 2011-07-04 between 00:27 and 01:27. This resulted in missing data in passes 158 & 159. The affected OGDR is:

JA2_OPN_2PcS110_158_20110704_001230_20110704_031216

Data gaps in passes 158 and 159 can be seen in the S.E. Pacific and S. Atlantic in the Cycle-110 plots in Appendix A.

b. **On-board software and calibration file uploads** - When new instrument calibration coefficients, or onboard software patches, are uploaded to the satellite data gaps usually result whose extent can vary from just a few seconds to hours in length. This includes events associated with software uploads, including Digital Elevation Model (DEM) updates, as well as calibration files.

Three cycles were affected by software uploads and calibration updates this year:

Cycle-081: Due to a DEM update, passes 087 and 237 have 16% and 7% of the ocean measurements missing, respectively. The data gaps are on 2010-09-16 from 16:40:22 to 16:52:48 (pass 087) and on 2010-09-22 from 13:07:27 to 13:18:12 (pass 237). The affected OGDRs are:

JA2_OPN_2PcS081_087_20100916_163919_20100916_183915
JA2_OPN_2PcS081_237_20100922_130657_20100922_150242

Cycle-084: An I2 & Q2 calibration was performed on 2010-10-14 from 06:02:00 to 06:11:15 (pass 031). And an I & Q calibration was performed on 2010-10-14 from 06:12:00 to 06:21:15 (passes 031 & 032). Due to these two calibrations pass 031 is missing 8% of its ocean measurements. The affected OGDR is:

JA2_OPN_2PcS084_030_20101014_042829_20101014_062446

Cycle-094: A CAL1 calibration was performed on 2011-01-29 from 04:50 to 04:55 (pass 231), a CAL2 calibration from 05:38 to 06:11 (pass 232), and a CNG calibration from 08:37 to 09:03 (pass 235, mostly over land). Due to these three calibrations passes 231, 232 and 235 are missing 14%, 65%, and 9% of their ocean measurements. The affected OGDRs are:

JA2_OPN_2PcS094_230_20110129_034732_20110129_052706
JA2_OPN_2PcS094_231_20110129_052728_20110129_072311
JA2_OPN_2PcS094_235_20110129_082757_20110129_105043

c. **Instrument or data processing anomalies** – Anomalies at the instrument level, or in the ground segment, can result in partial loss of data or degradation in performance. This year there were several incidents where the AMR processing in the TM-NRT failed, resulting in ‘defaulted’ wet troposphere correction and SSHA data.

Five cycles were impacted by AMR anomalies:

Cycle-080: On 2010-09-13 at 02:45:19 the TM-NRT failed to properly ingest any AMR data. The only affected OGDR is:

JA2_OPN_2PcS080_248_20100913_005430_20100913_022828

The gap in AMR wet and SSHA for passes 248 & 249 can be seen in the plots in Appendix A. Wind and wave data were not affected, and the problem was corrected during GDR production.

Cycle-084: On 2010-10-21, at approximately 06:40, an anomaly in the AMR instrument caused subsequent AMR data to have incorrect timestamps until the AMR was reset 12:33:08. TM-NRT produces 'defaulted' AMR and SSHA data between 06:40 and 18:23, lasting longer than the instrument anomaly, until its internal database was cleared of the bad timestamp information. Significant Wave Height and wind values were not affected. The affected OGDRs are:

JA2_OPN_2PcS084_211_20101021_064019_20101021_083426
JA2_OPN_2PcS084_211_20101021_064019_20101021_103326
JA2_OPN_2PcS084_215_20101021_103326_20101021_123219
JA2_OPN_2PcS084_217_20101021_123218_20101021_142916
JA2_OPN_2PcS084_220_20101021_142915_20101021_162538
JA2_OPN_2PcS084_222_20101021_162537_20101021_182317

The long-lasting impact to the wet correction and SSHA data in passes 211-224 can be seen in the plots for cycle-084 in Appendix A. There was no impact to wind/wave data, and the AMR timestamps were corrected so that no errors were encountered during GDR processing.

Cycle-099: On 2011-03-20 TM-NRT again failed to properly ingest AMR data. This is a recurrence of the anomaly on 2011-09-13, Cycle-080. The affected OGDR is:

JA2_OPN_2PcS099_248_20110320_102646_20110320_120222

The affect on the AMR wet and SSHA in passes 248 and 249 can be seen in the plots in Appendix A. Again, wind and wave data were not affected, and the error was corrected in the GDR processing

Cycle-105: On 2011-05-09 TM-NRT again failed to properly ingest AMR data. This is a recurrence of the anomaly on 2011-09-13, Cycle-080. After a TM-NRT swap at EUMETSAT, an OGDR was created which did not suffer a loss of MR data. The affected OGDR is:

JA2_OPN_2PcS105_006_20110509_113111_20110509_130328

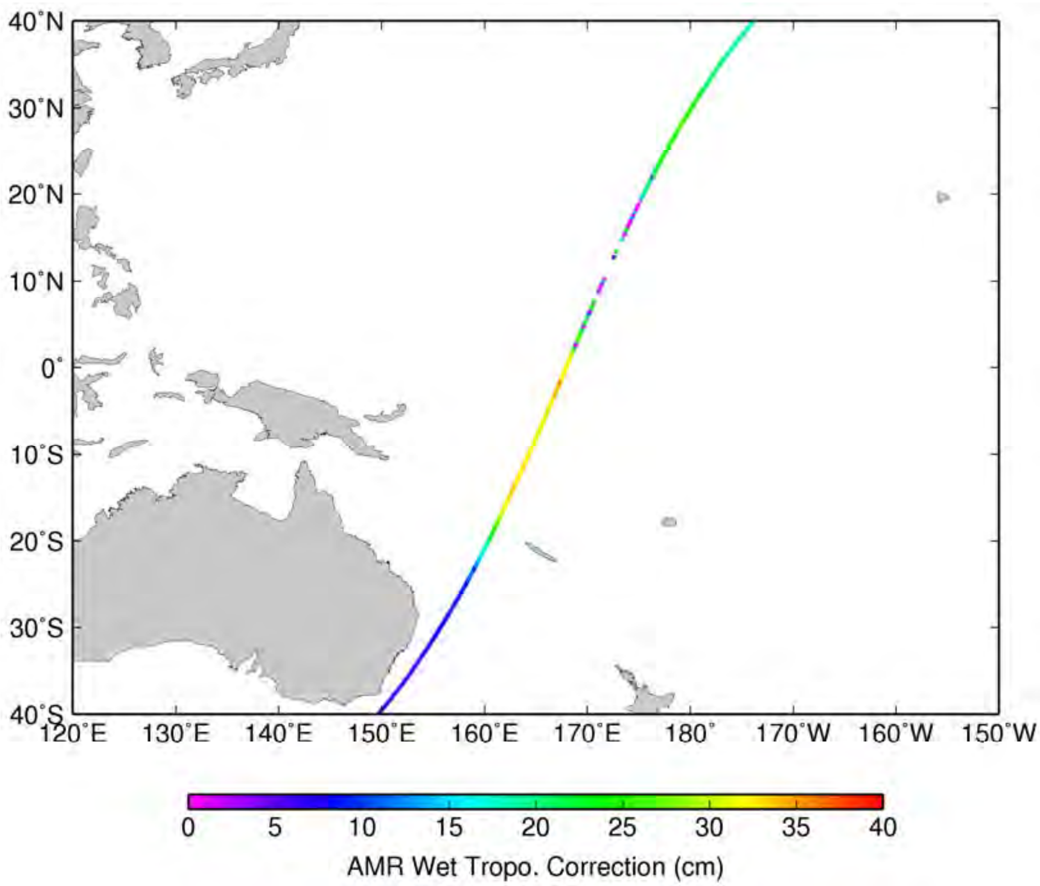
The affect on the AMR wet and SSHA in passes 006 and 007 can be seen in the plots in Appendix A. Again, wind and wave data were not affected, and the error was corrected in the GDR processing.

Cycle-110: On 2011-06-29 the AMR experienced higher than expected values in all 3 brightness temperatures (BT) channels on Cycle-110, pass 047, between latitudes 0 and 25 degrees. NASA/JPL later confirmed that the source of the problem was Radio

Frequency interference from some ground/ocean source causing high BT values resulting in abnormally low wet troposphere correction values. The affected OGDR is:

JA2_OPN_2PcS110_046_20110629_145921_20110629_164645

The impact cannot be seen in the global plots in Appendix A, but is quite apparent when the individual 1Hz data are plotted for this OGDR. Note the missing and very low (purple) values between 0° and 25° N.



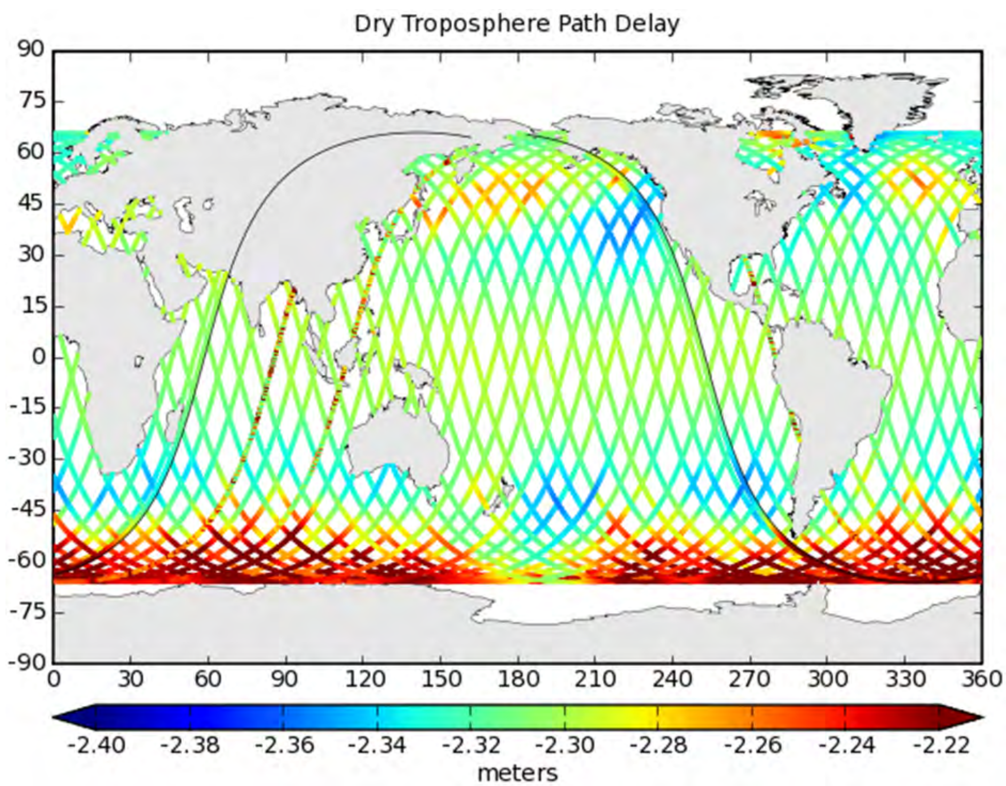
d. **Unavailability or degradation of auxiliary data –** Computation of SSHA requires auxiliary data which is not acquired by the on-board instruments. When these data are missing or degraded it can impact the quality of SSHA while not affecting SWH and wind speed.

One cycle was impacted by an auxiliary data processing error, associated with an upgrade to the ECMWF model grids:

Cycle-104: On 2011-05-04 the ECMWF meteorological data processing was upgraded from low spatial-resolution 'N400' grids to high spatial-resolution 'N640' grids. Due to an anomaly in the interpolation of the higher resolution surface pressure grids, errors arose in the dry troposphere and inverse barometer corrections which grew larger in each subsequent OGDR. This resulted in degraded SSH data from 00:27 to 01:27. There was no impact to SWH and wind speed data, and the error was corrected in the GDR processing. The affected OGDRs were:

JA2_OPN_2PcS104_126_20110504_060029_20110504_075846
JA2_OPN_2PcS104_128_20110504_075845_20110504_094146
JA2_OPN_2PcS104_130_20110504_094145_20110504_113513

Errors had reached the meter level in the last of the 3 OGDRs, and in order to test that the error was corrected this OGDR was reprocessed and disseminated within 2 hours of the original, degraded, version. The plots in Appendix A for Cycle-104 are based on the reprocessed OGDR, and therefore don't clearly exhibit the problems. The following plot from the Near Real-Time Altimeter Validation System, which is used to routinely monitor the OGDRs, shows the impact in the dry troposphere correction for the first two OGDRs (affecting passes 126-130). The black trace corresponds to the third, reprocessed, OGDR, illustrating that the interpolation problem had been corrected.



e. **Gaps in payload telemetry** – Rarely there are additional losses of payload telemetry data, beyond the causes discussed above, which result in gaps in all the measured variables.

Two cycles were affected by telemetry data gaps:

Cycle-084: There is a small data gap on 2010-10-14 from 17:00:57 to 17:02:39, due to missing PLTM-1 telemetry data. Pass 043 is missing 4% of its ocean measurements. The affected OGDR is:

JA2_OPN_2PcS084_042_20101014_154319_20101014_174038

Cycle-101: This cycle has one completely missing pass, and two partially missing passes, due to lost telemetry data at Usingen. There is a gap on 2011-04-04 from 18:49:08 to 21:03:48. Passes 133 to 135 are missing 23%, 100%, and 91% of their ocean measurements, respectively. The missing data are between the following two OGDRs:

JA2_OPN_2PcS101_132_20110404_173900_20110404_184908
JA2_OPN_2PcS101_135_20110404_210348_20110404_225746

This is a very unusual instance where a significant amount of telemetry data was lost due to a procedural error with the satellite to ground data dump.

Section 5.0 Analysis of Data Gaps in the OGDRs

There is a high-level Jason-2 mission/system requirement that is relevant to the anomalies discussed in the previous section:

> ***The GDR shall contain 95% of all possible over-ocean data (acquisition and archive) during any 12 month period, with no systematic gaps.***

To assess our performance with regard to this requirement, based on the near real-time OGDRs, all of the data for cycles 74-110 were checked for data gaps between measurements (and between files) when either of the two measurements was over the ocean. Using a nominal inter-record spacing, $\Delta t = 1.02$ seconds, a gap is identified whenever two measurements are separated by more than $2*\Delta t$. Duplicate data, associated with re-dumping of data stored on-board Jason-2 (i.e. when two OGDRs have the same start time) were skipped during gap detection.

The cumulative result for 4539 analyzed OGDRs was a total of 20,764,412 over-ocean records (of the total 30,202,739 records) with missing records from data gaps totaling 32,396. This is equivalent to ~9.1 hours of missing data over the course of the year. The gap analysis indicates that 0.156% of open-ocean data are missing due to missing telemetry, calibrations, etc., for a total over-ocean data return of 99.84%.
The various AMR anomalies discussed in section 4 represent another ~16.4 hours of data loss (based on the start/end times of the affected OGDRs) which includes both ocean and land data. Since these errors are corrected in the final GDRs, and do not affect the wind/wave data, they are not considered further in this analysis.

The following OGDRs had data gaps in excess of ten seconds, with the most significant gaps observable in the plots in Appendix A, as discussed above:

OGDR File Name	Gap
JA2_OPN_2PcS074_018_20100706_133208_20100706_152748	13
JA2_OPN_2PcS075_018_20100716_112953_20100716_132609	11
JA2_OPN_2PcS078_198_20100822_060901_20100822_075547	69
JA2_OPN_2PcS080_018_20100904_012208_20100904_031825	11
JA2_OPN_2PcS080_248_20100913_005430_20100913_022828	129
JA2_OPN_2PcS081_018_20100913_232116_20100914_011730	10
JA2_OPN_2PcS081_087_20100916_163919_20100916_183915	732
JA2_OPN_2PcS081_108_20100917_114855_20100917_150523	7492
JA2_OPN_2PcS082_070_20100925_220510_20100925_234002	522
JA2_OPN_2PcS083_071_20101005_213659_20101005_233351	20
JA2_OPN_2PcS083_198_20101010_200054_20101010_214836	12
JA2_OPN_2PcS083_248_20101012_185056_20101012_202423	914
JA2_OPN_2PcS084_042_20101014_154319_20101014_174038	101
JA2_OPN_2PcS084_178_20101019_231722_20101020_004720	20
JA2_OPN_2PcS084_211_20101021_064019_20101021_083426	119
JA2_OPN_2PcS084_211_20101021_064019_20101021_103326	490
JA2_OPN_2PcS084_215_20101021_103326_20101021_123219	144
JA2_OPN_2PcS084_217_20101021_123218_20101021_142916	155
JA2_OPN_2PcS084_220_20101021_142915_20101021_162538	72
JA2_OPN_2PcS084_222_20101021_162537_20101021_182317	119
JA2_OPN_2PcS084_234_20101022_033903_20101022_070331	357
JA2_OPN_2PcS084_239_20101022_085847_20101022_105625	273

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JA2_OPN_2PcS085_254_20101101_202634_20101101_214957 2265
JA2_OPN_2PcS086_032_20101103_023405_20101103_054726  106
JA2_OPN_2PcS090_120_20101216_044252_20101216_063958   14
JA2_OPN_2PcS092_122_20110105_023738_20110105_042347   15
JA2_OPN_2PcS092_236_20110109_132255_20110109_145216  751
JA2_OPN_2PcS093_007_20110110_132148_20110110_151426 1560
JA2_OPN_2PcS094_070_20110122_214835_20110122_232231 1418
JA2_OPN_2PcS094_230_20110129_034732_20110129_052706  295
JA2_OPN_2PcS094_231_20110129_052728_20110129_072311 1963
JA2_OPN_2PcS097_027_20110220_001401_20110220_020850  477
JA2_OPN_2PcS097_098_20110222_175502_20110222_195128  972
JA2_OPN_2PcS098_098_20110304_155242_20110304_172431  610
JA2_OPN_2PcS099_248_20110320_102646_20110320_120222  120
JA2_OPN_2PcS101_135_20110404_210348_20110404_225746 7923
JA2_OPN_2PcS105_006_20110509_113111_20110509_130328  198
JA2_OPN_2PcS110_158_20110704_001230_20110704_031216 1672
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Section 6.0 Summary

The overall quality of the Jason-2/OSTM near real-time OGDR data is extremely good. Eight of the 37 cycles had significant defects (primarily gaps) in the cyclic plots - cycles 80, 84, 94, 99, 101, 105, 106 and 110. The major causes of data degradation were orbital maneuvers, calibration sequences, and AMR anomalies (which won't impact the final GDRs). The amount of missing data, attributed to all of the anomalies discussed in sections 4 and 5, is ~ 9.1 hours. **This represents an over-ocean data return of 99.84% over the time period analyzed, which is slightly more than one year.**

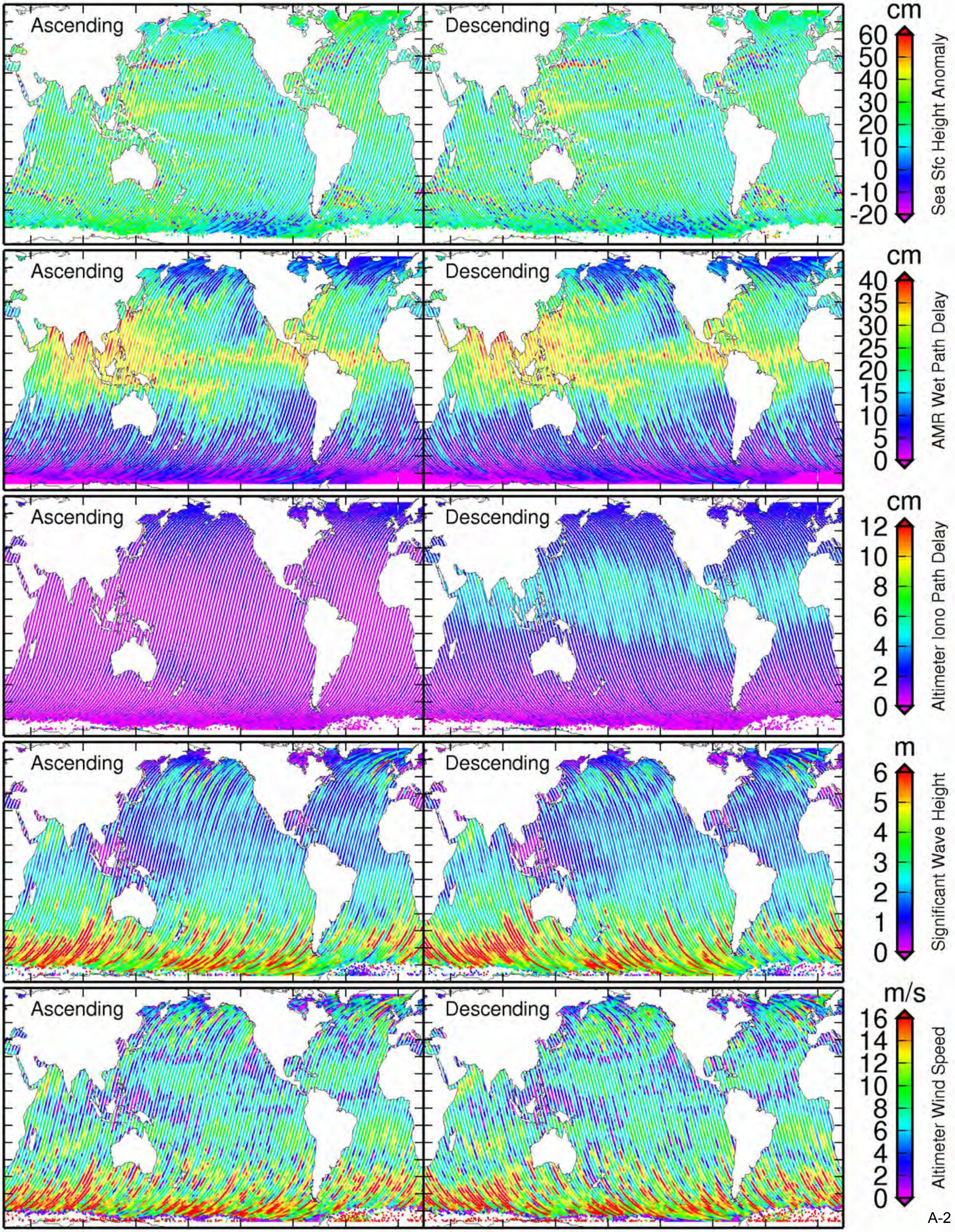
In addition to the high data return, the data availability in terms of latency is also well above the mission requirements: **94.49% of all data were available within 3 hours and 98.65% of all data were available within 5 hours**.

Operational monitoring of the OGDR data quality is ongoing at both NOAA and EUMETSAT using the NRTAVS system developed under a contract to JPL by NOAA. This monitoring tool generates plots similar to those presented below in Appendix-A. This tool has provided a valuable diagnostic for monitoring the OGDR data quality in near real-time.

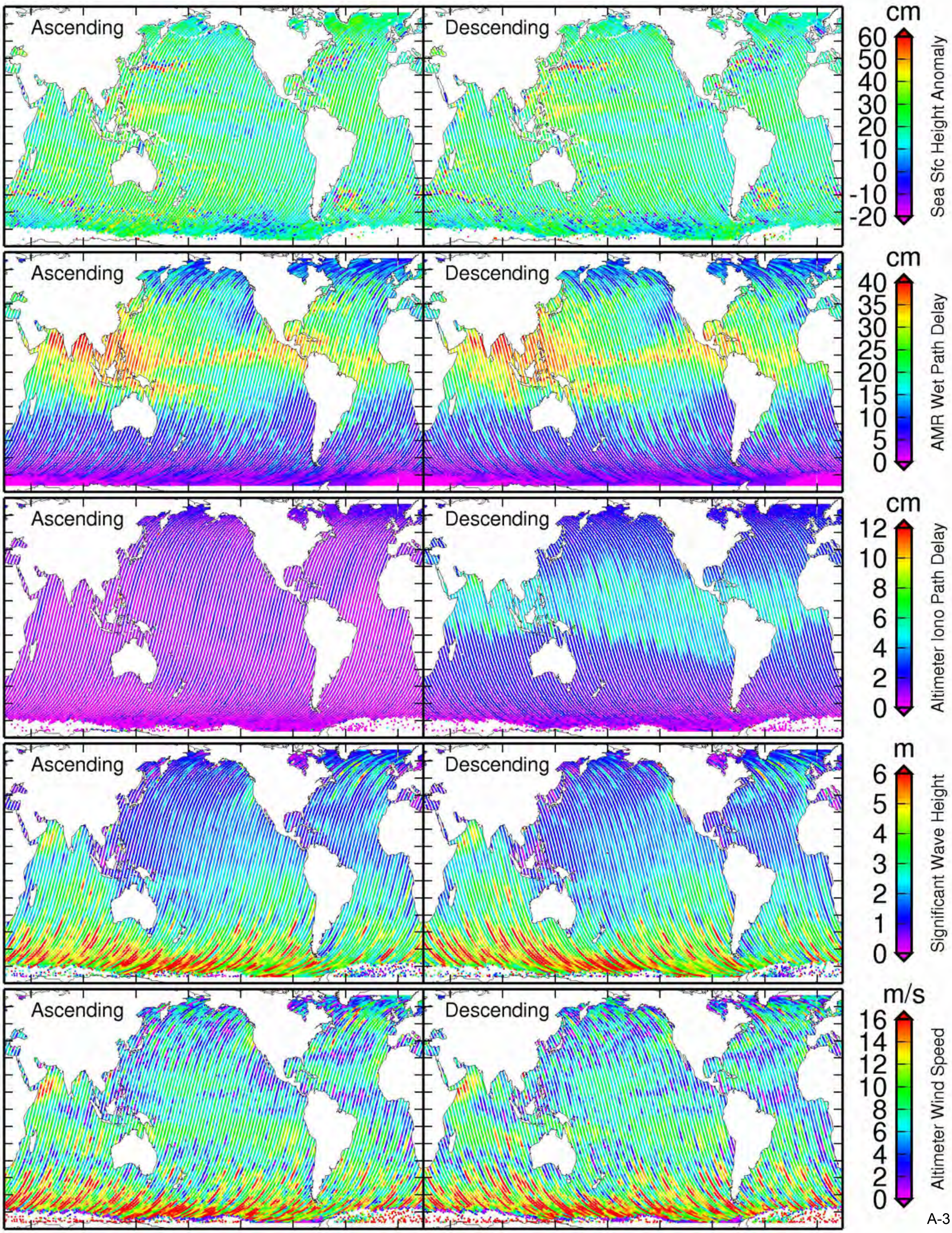
Appendix A. Cyclic Parameter Plots Cycle-074 to Cycle-110

See individual plots on the following 37 pages.

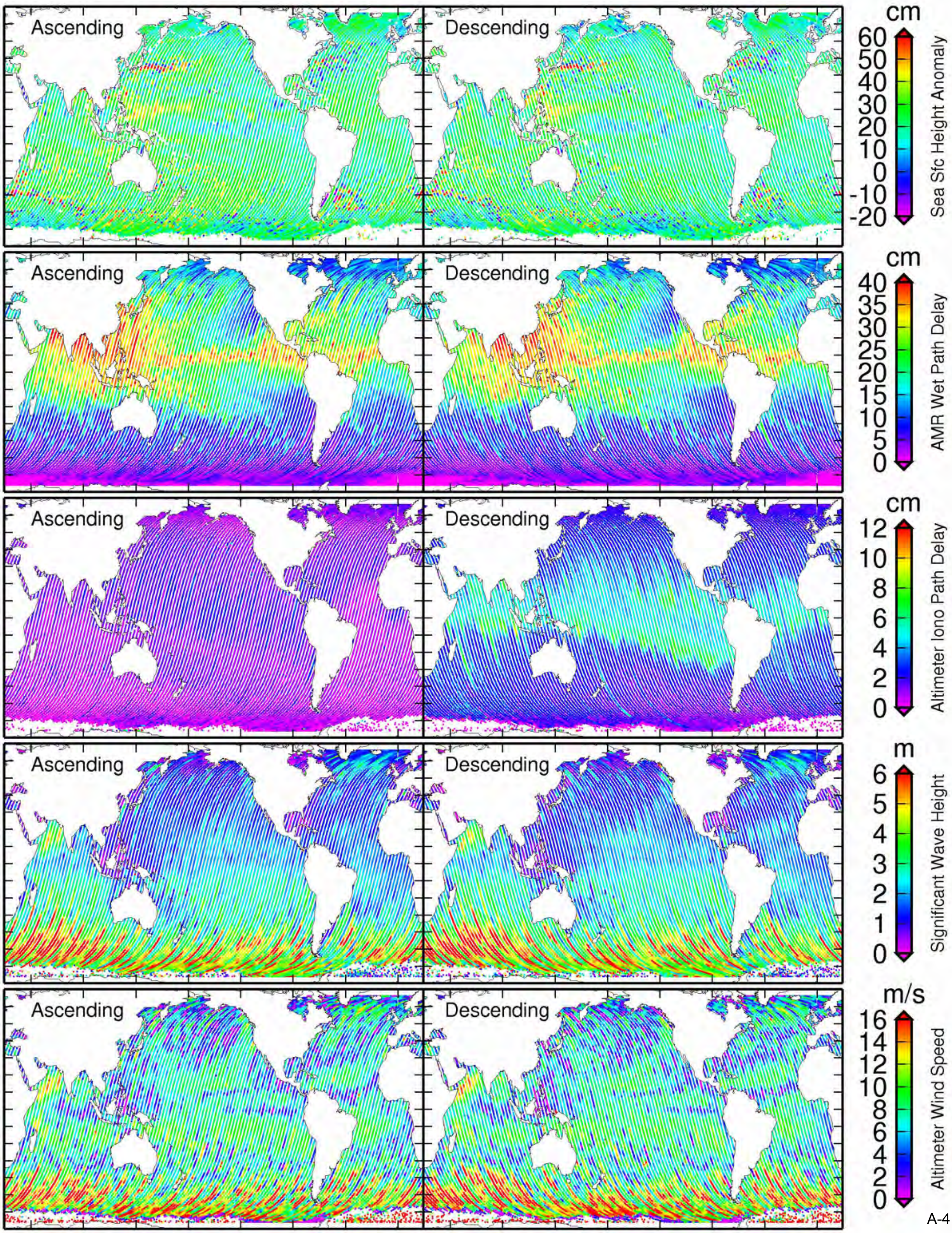
Jason-2 Cycle-074 2010-07-05 21:32:29 - 2010-07-15 19:31:00



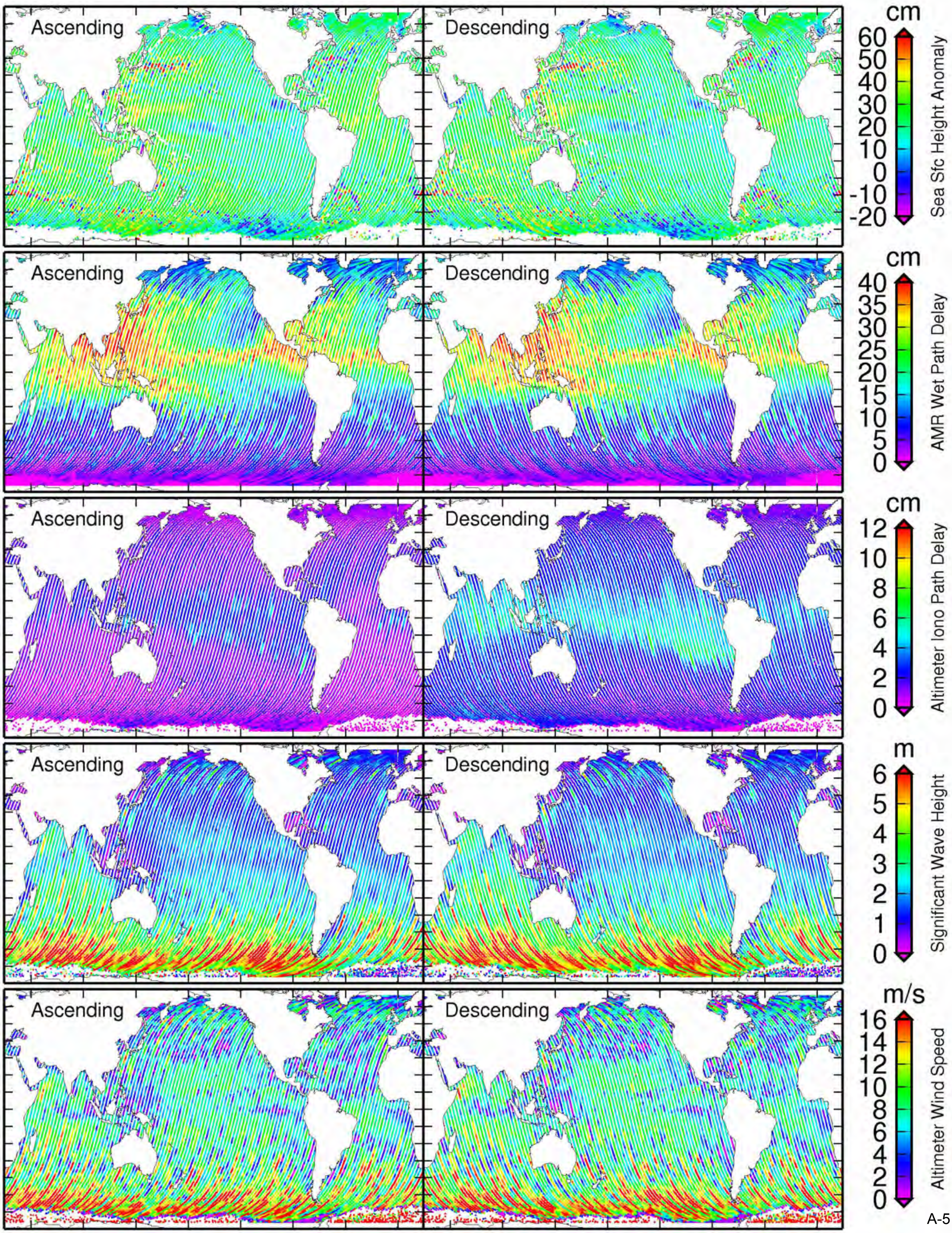
Jason-2 Cycle-075 2010-07-15 19:31:00 - 2010-07-25 17:29:32



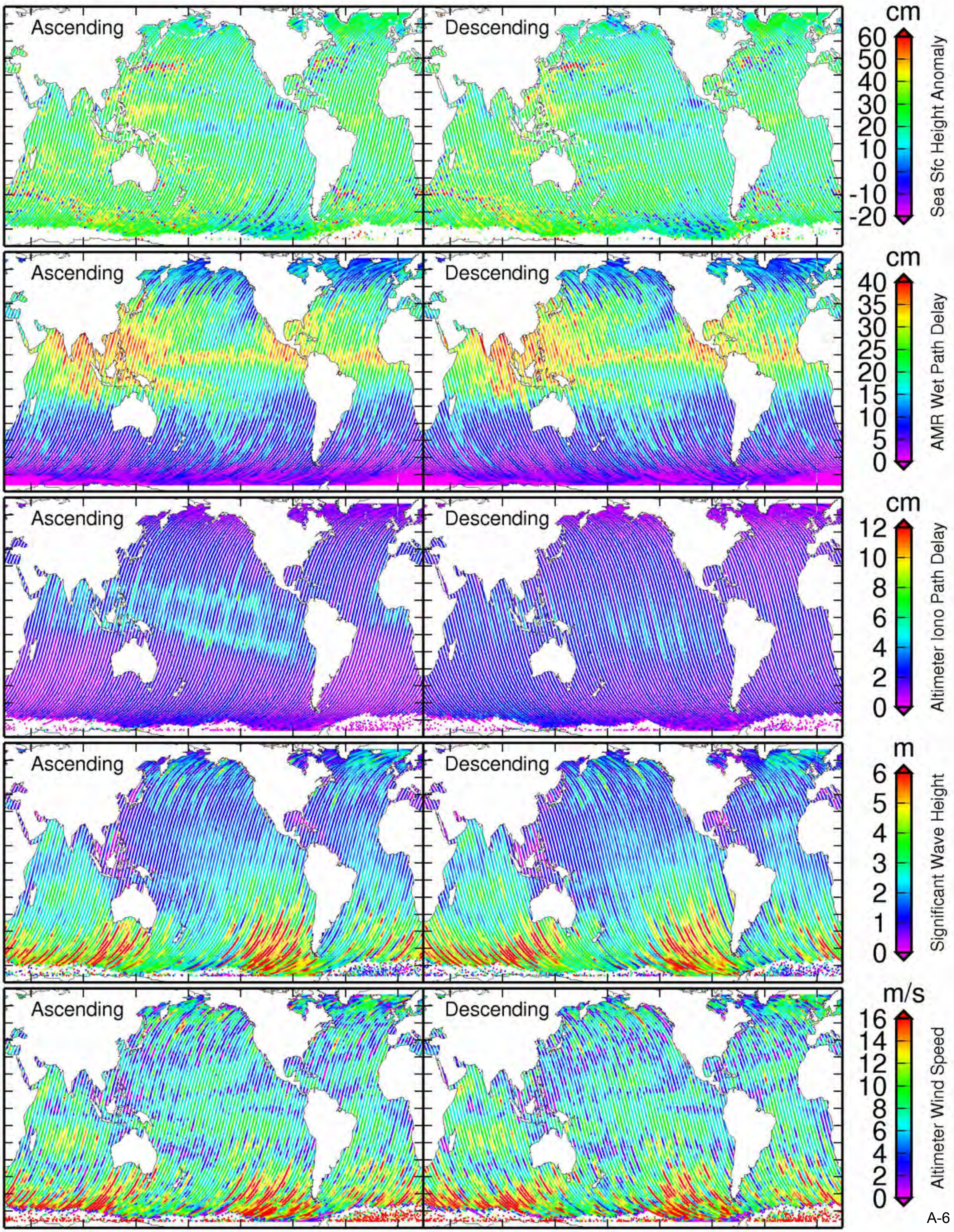
Jason-2 Cycle-076 2010-07-25 17:29:32 - 2010-08-04 15:28:04



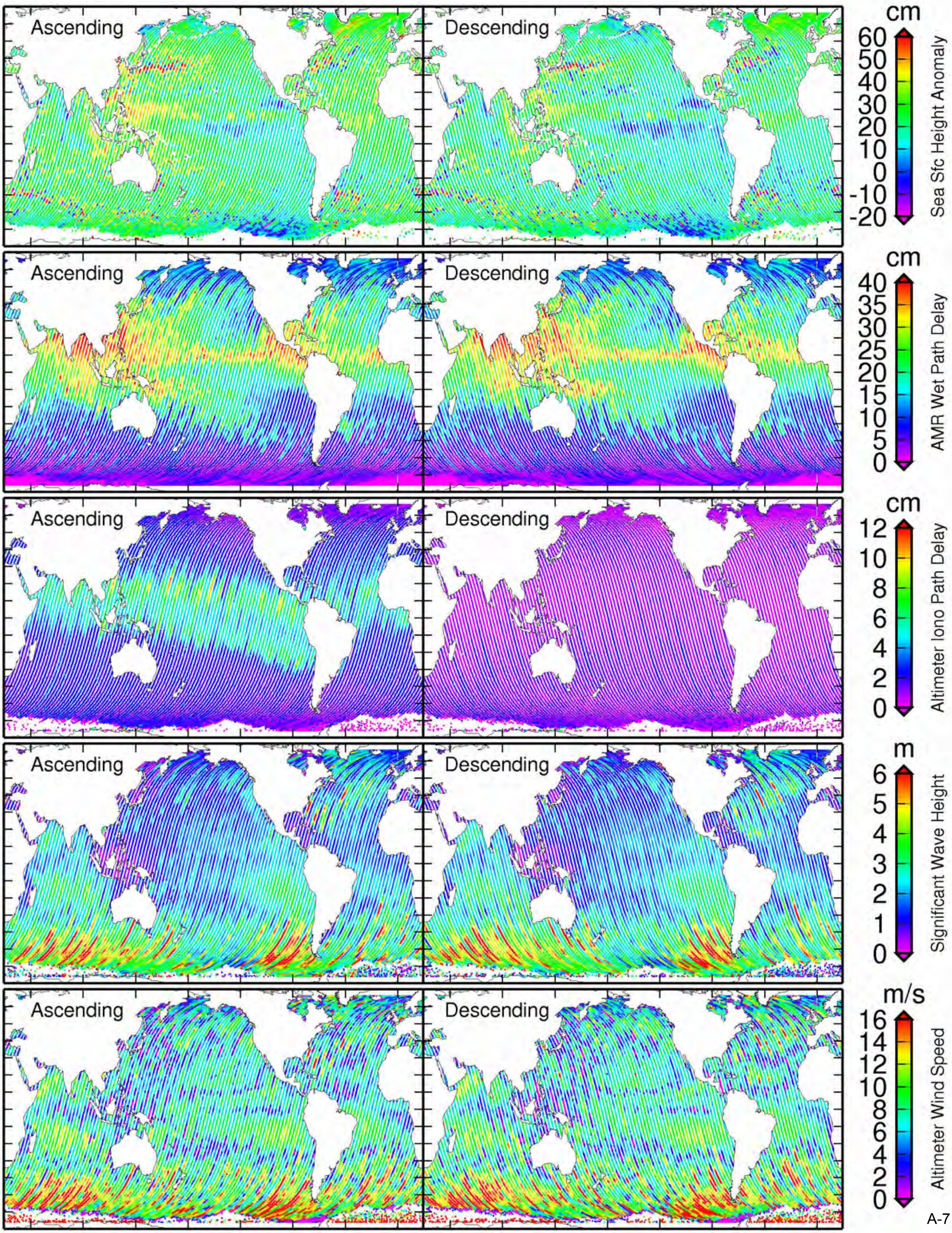
Jason-2 Cycle-077 2010-08-04 15:28:04 - 2010-08-14 13:26:35



Jason-2 Cycle-078 2010-08-14 13:26:35 - 2010-08-24 11:25:07



Jason-2 Cycle-079 2010-08-24 11:25:07 - 2010-09-03 09:23:38



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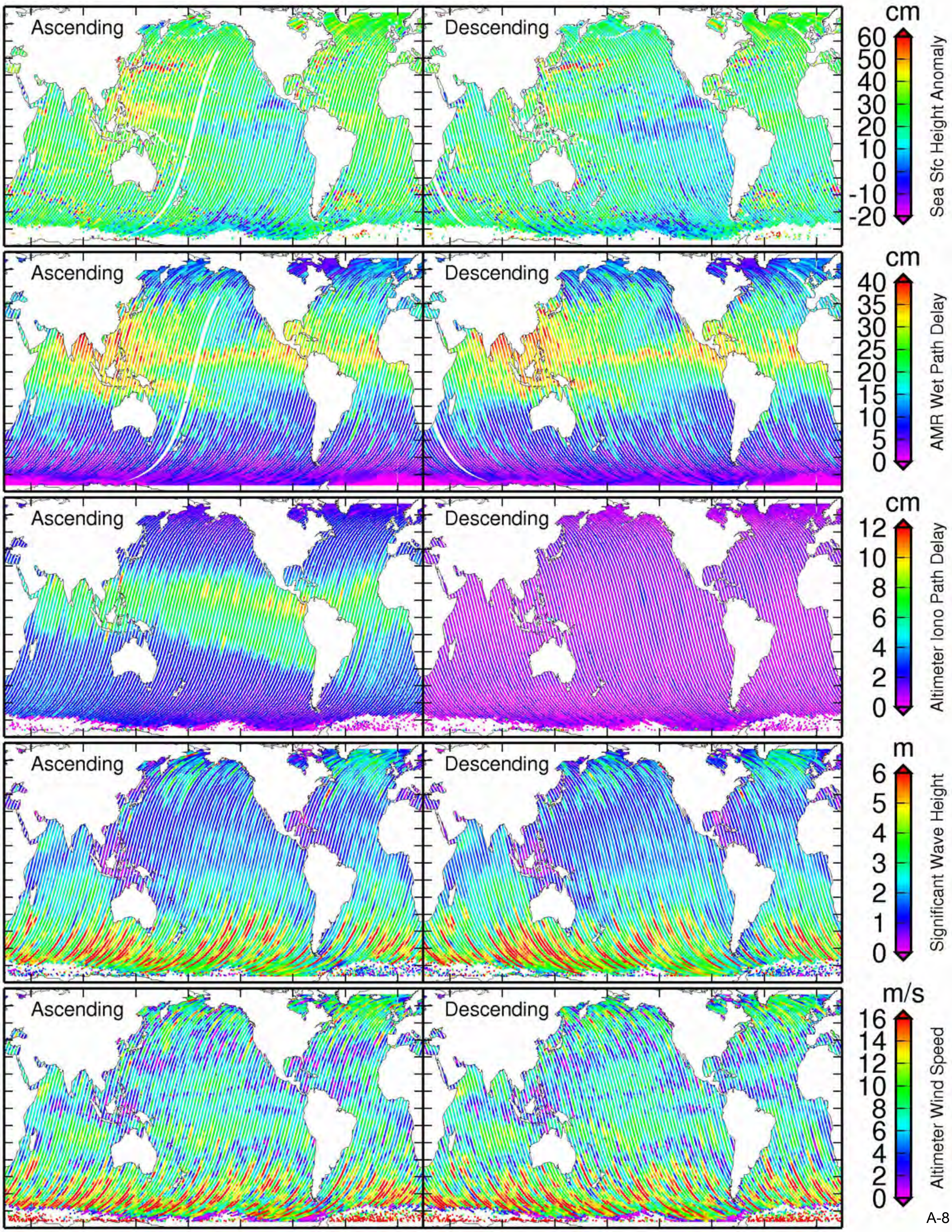

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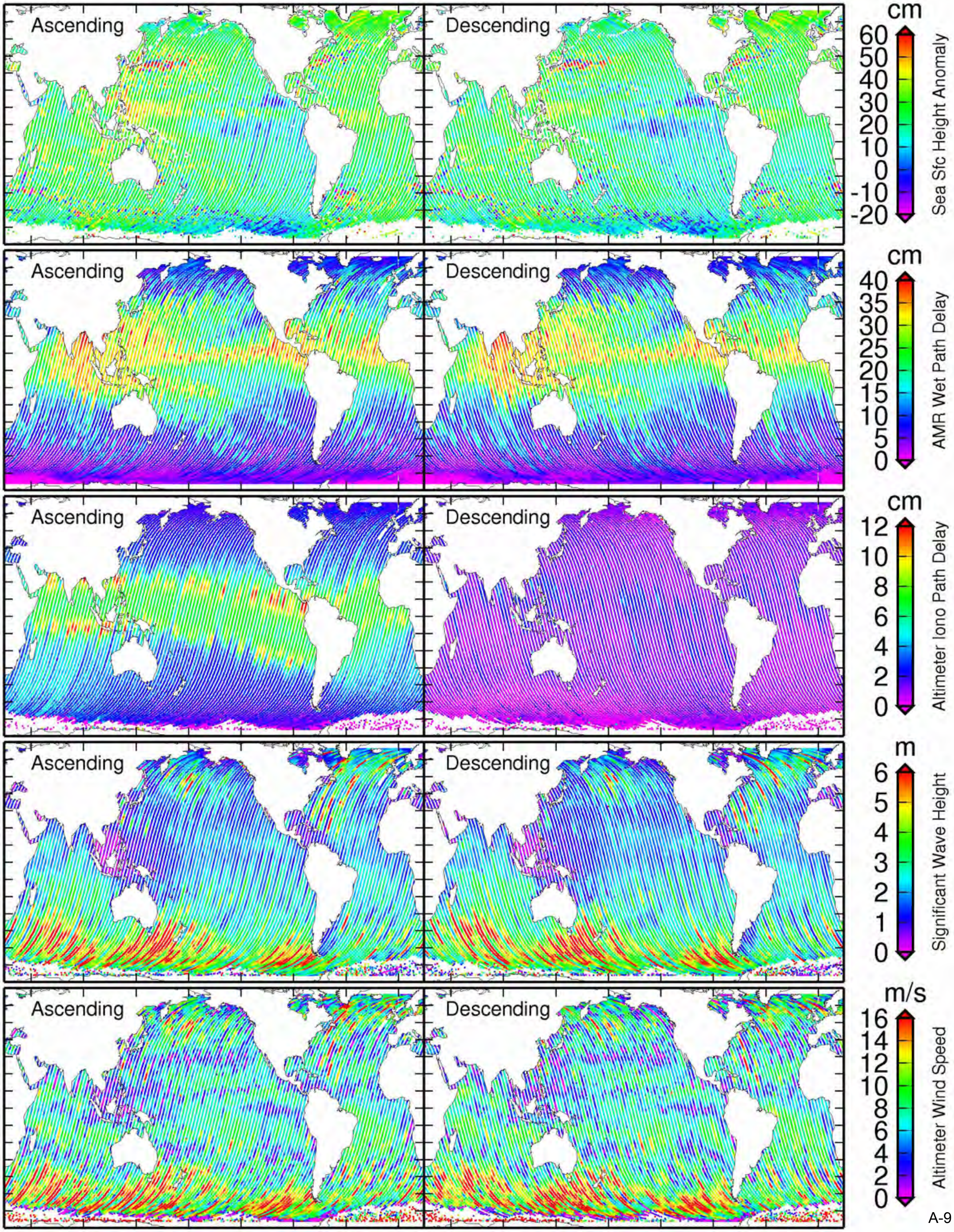

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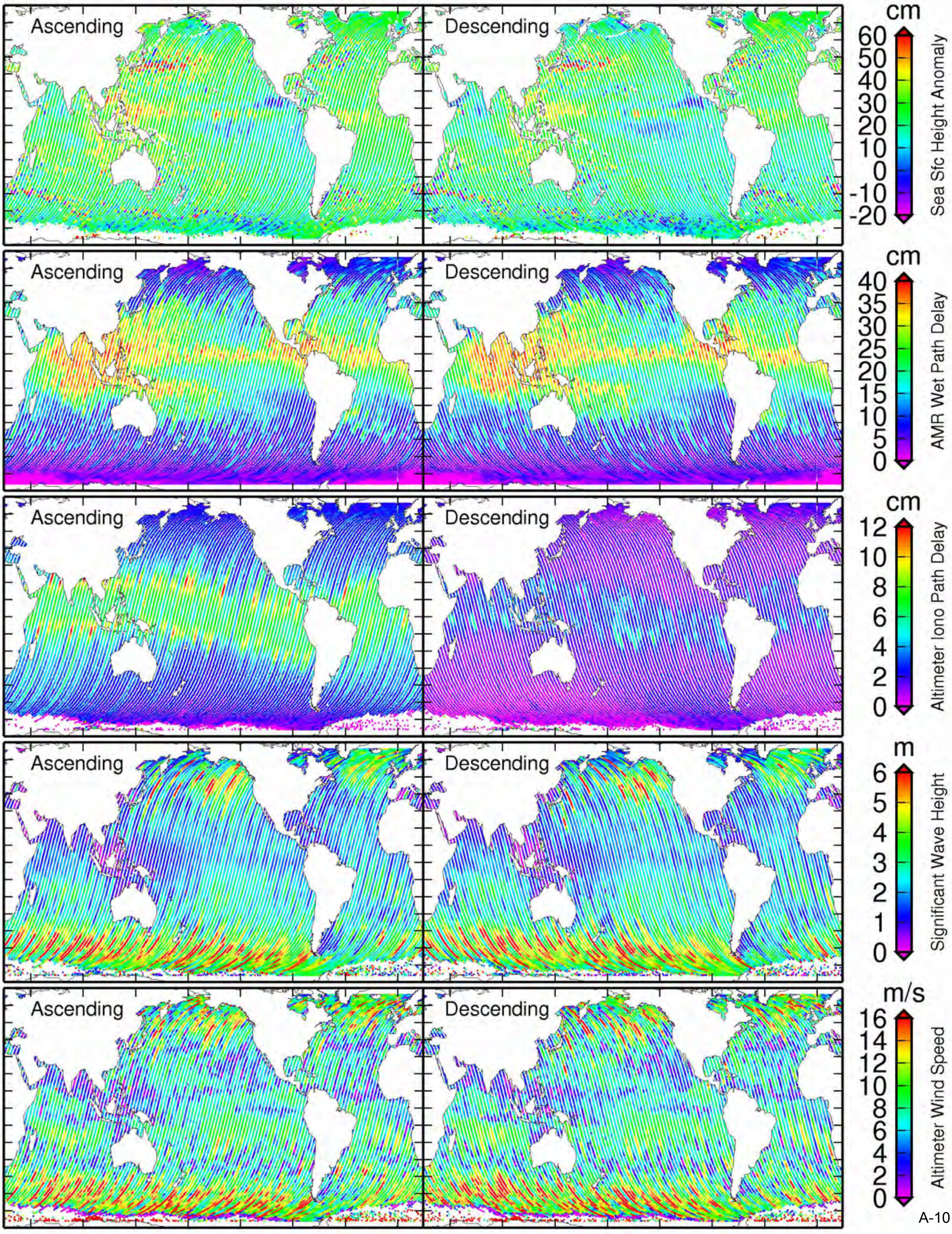

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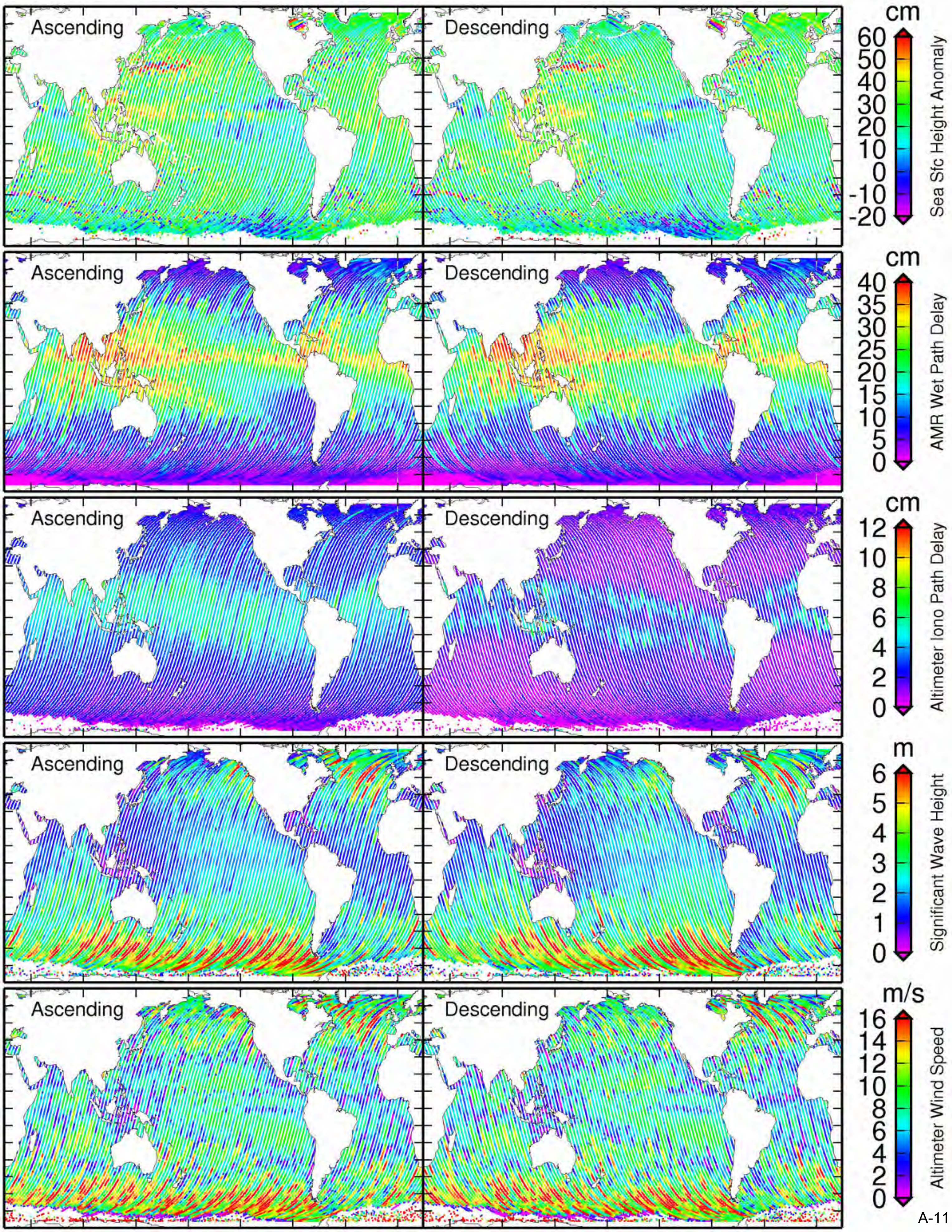

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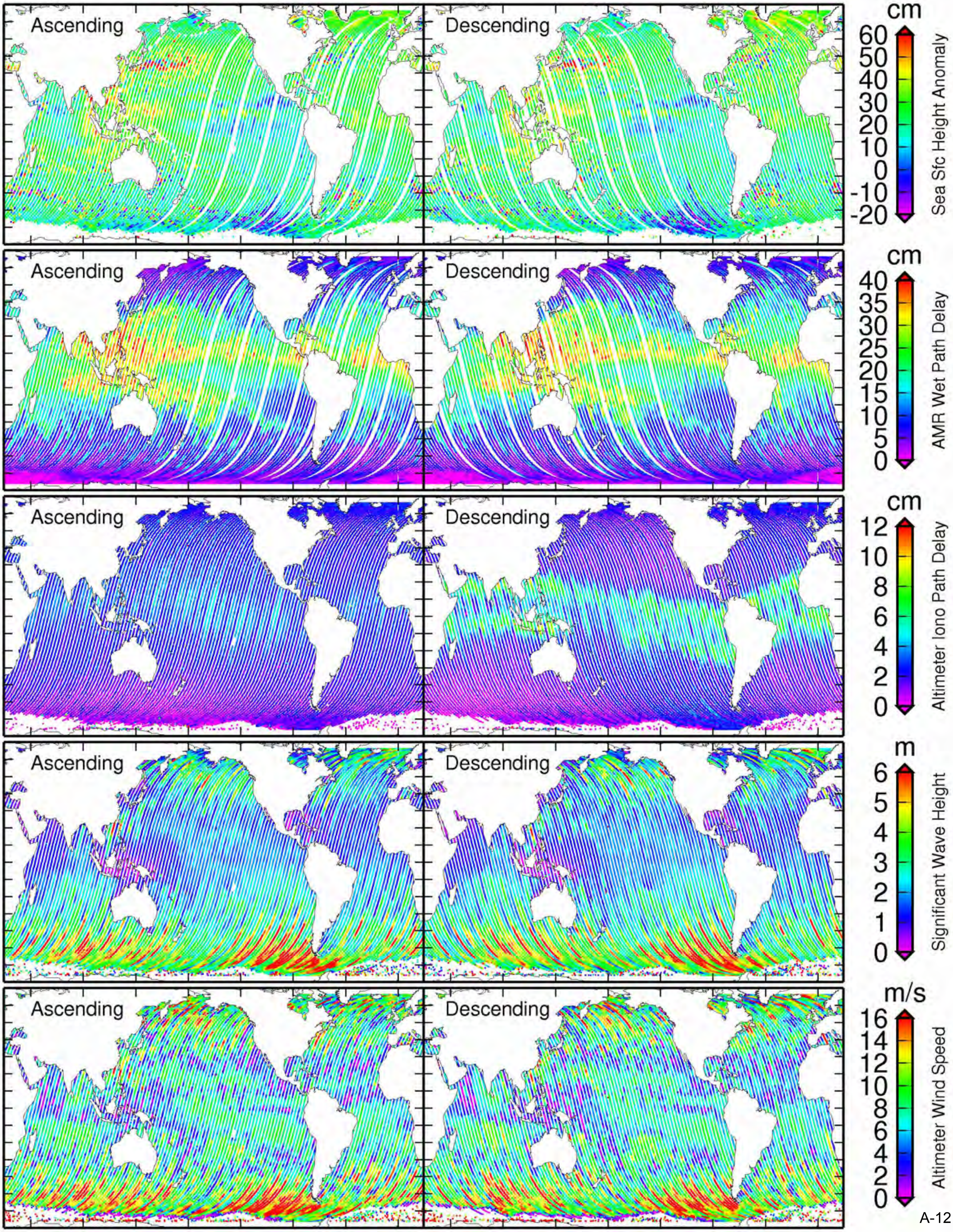

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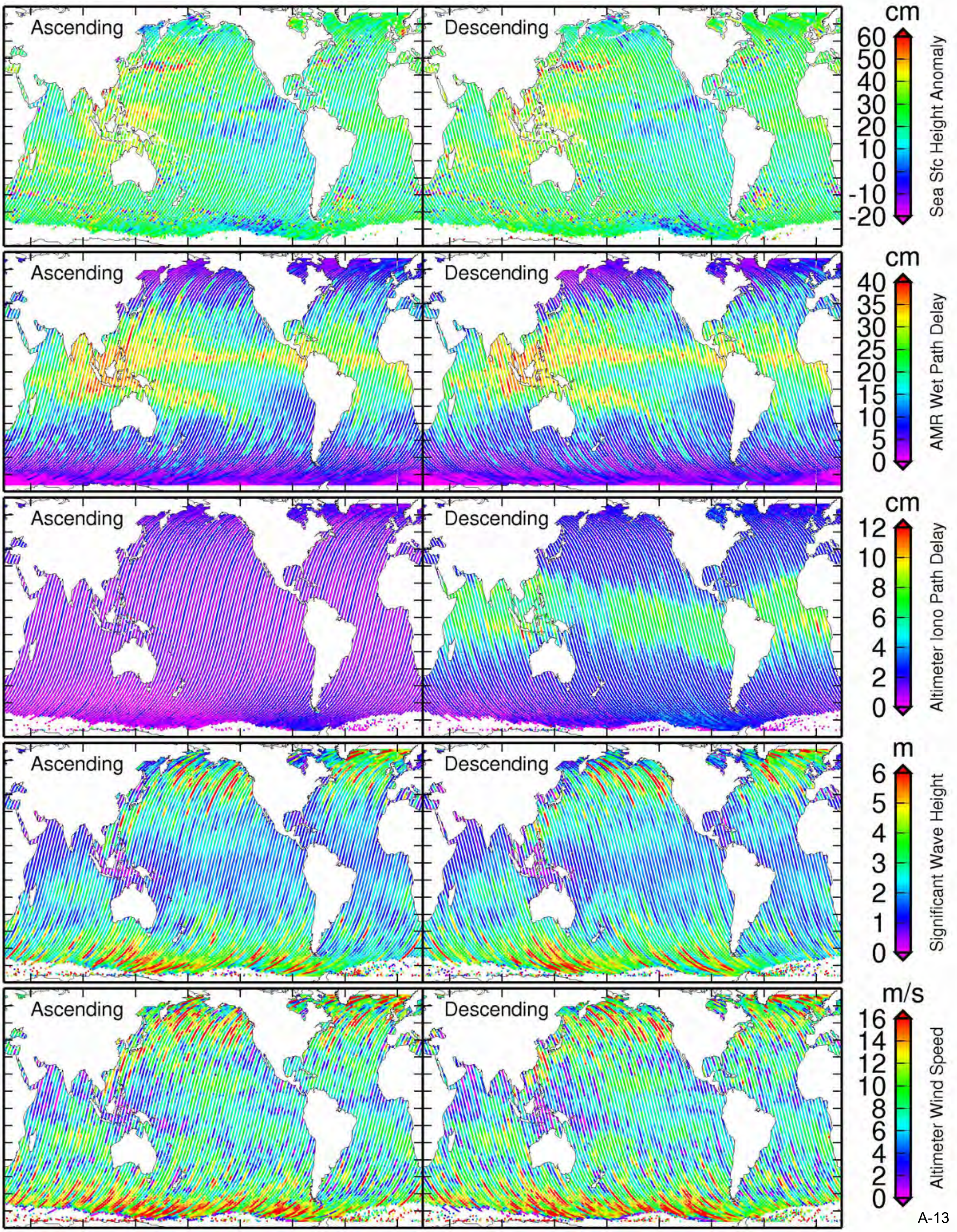

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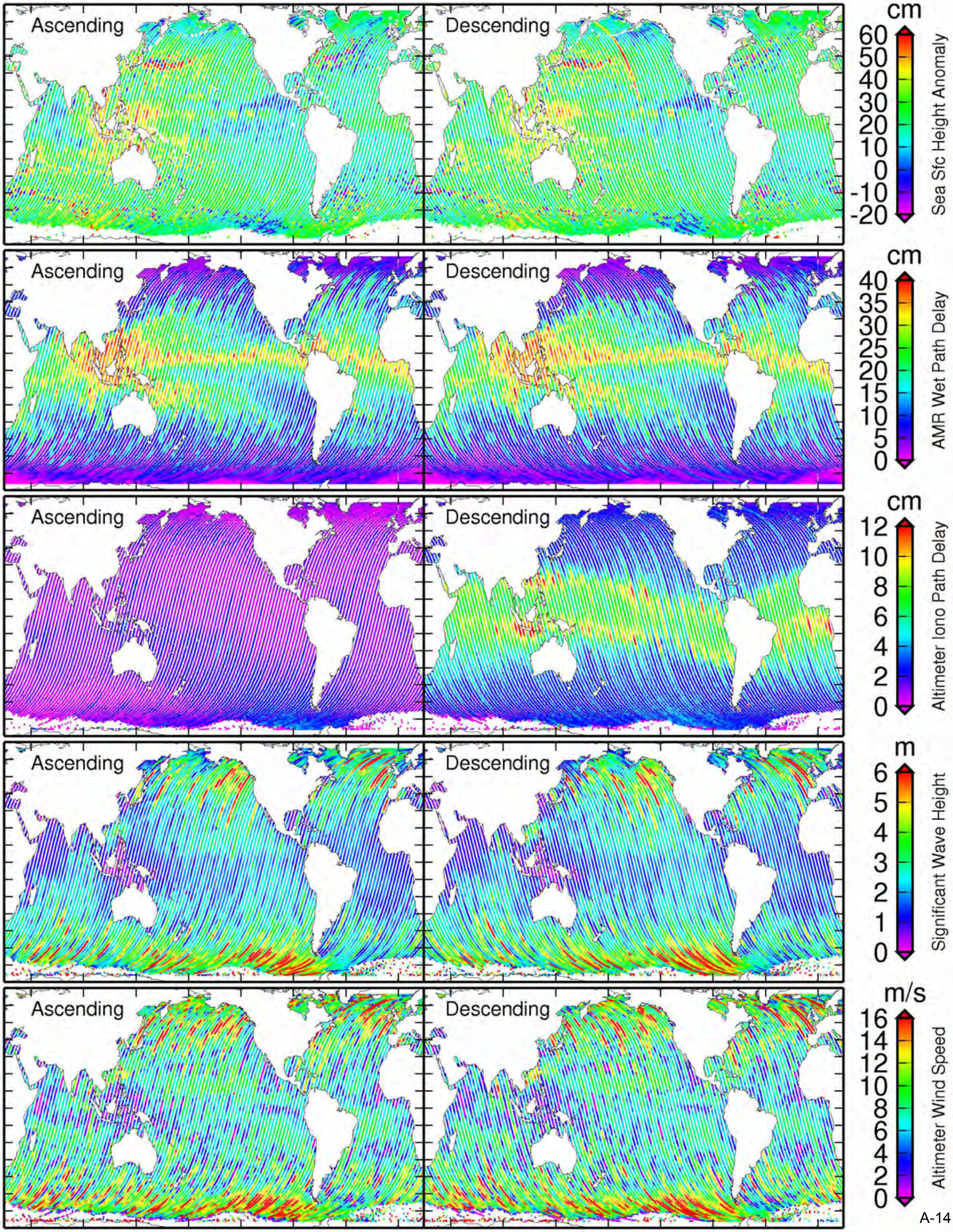

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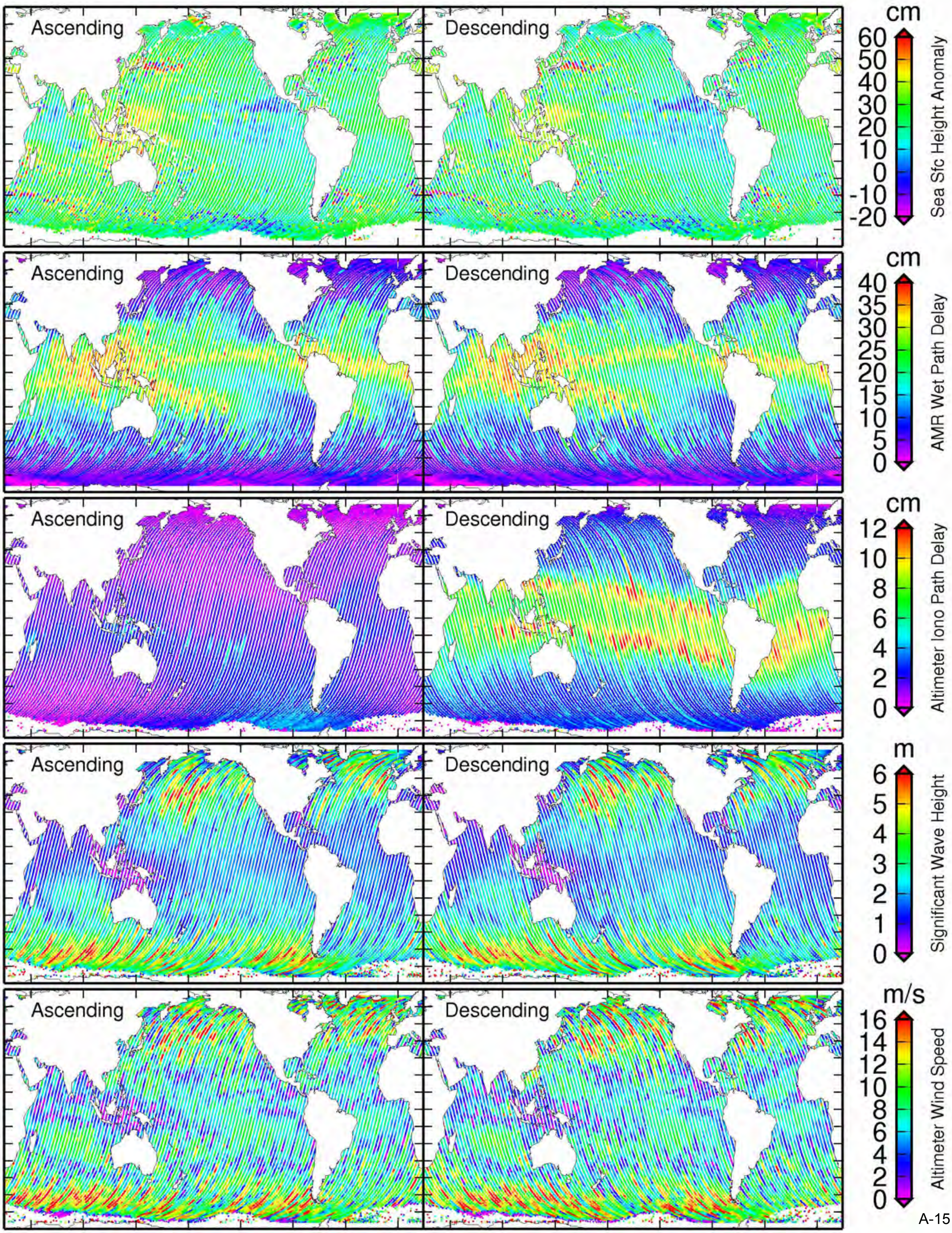

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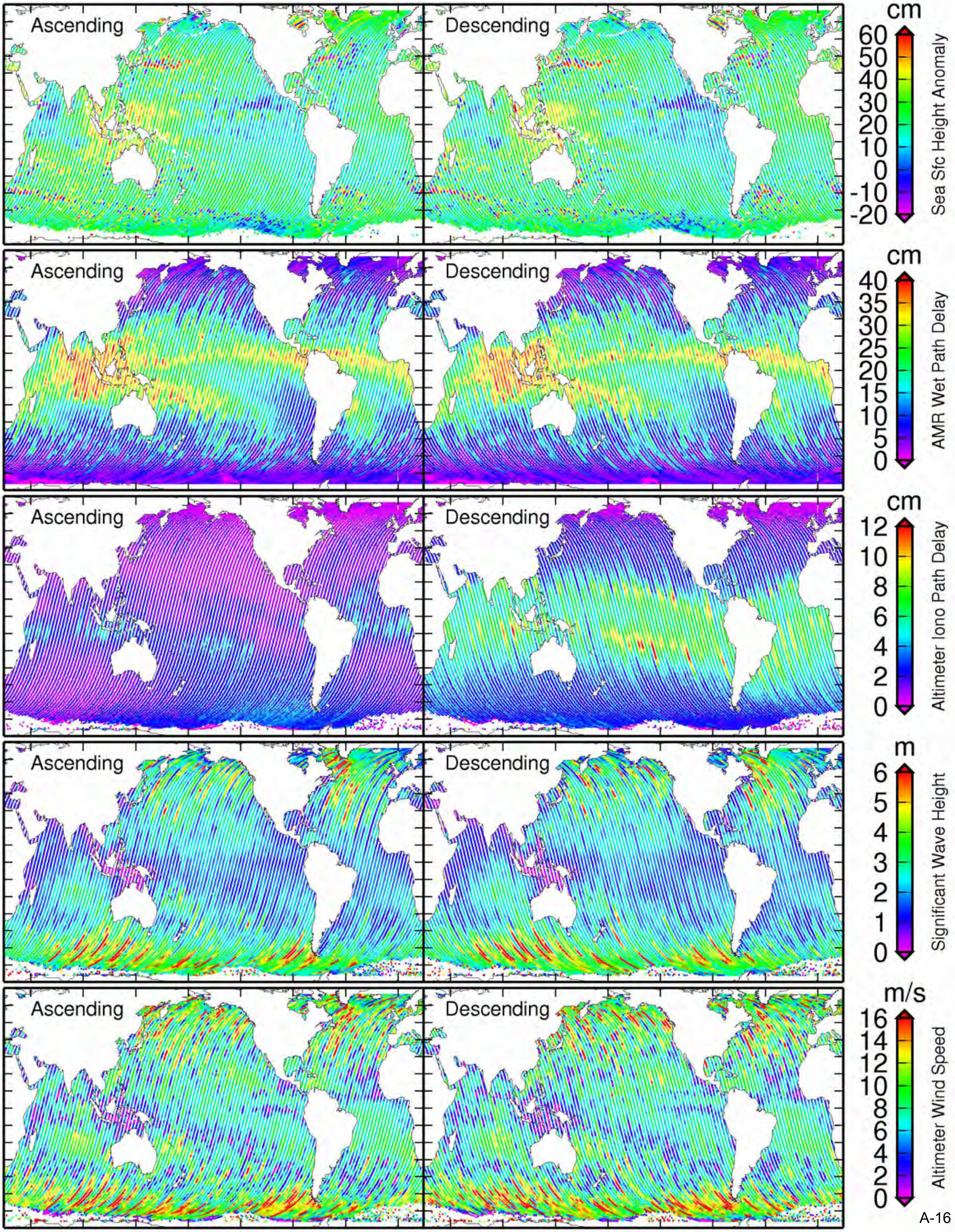

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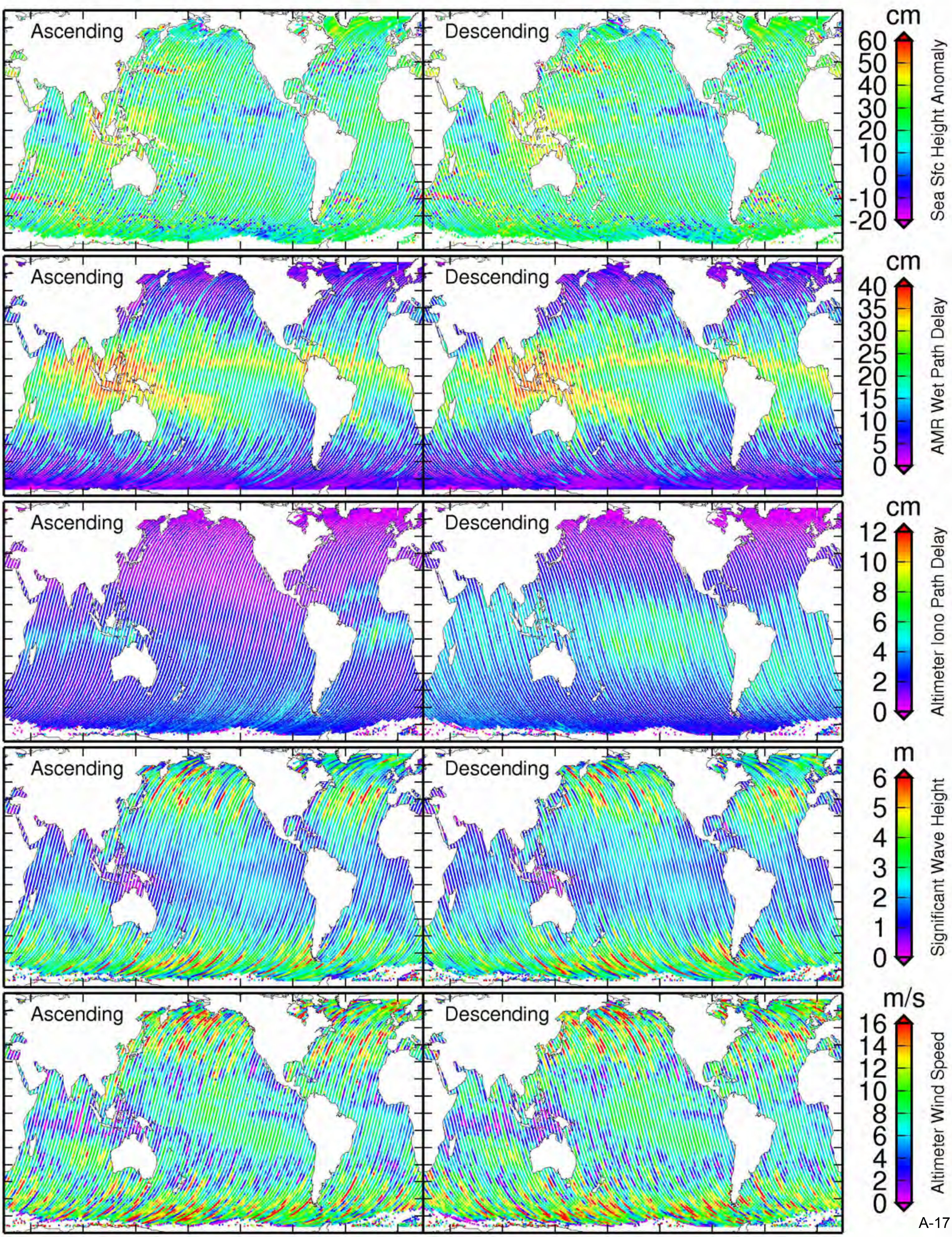

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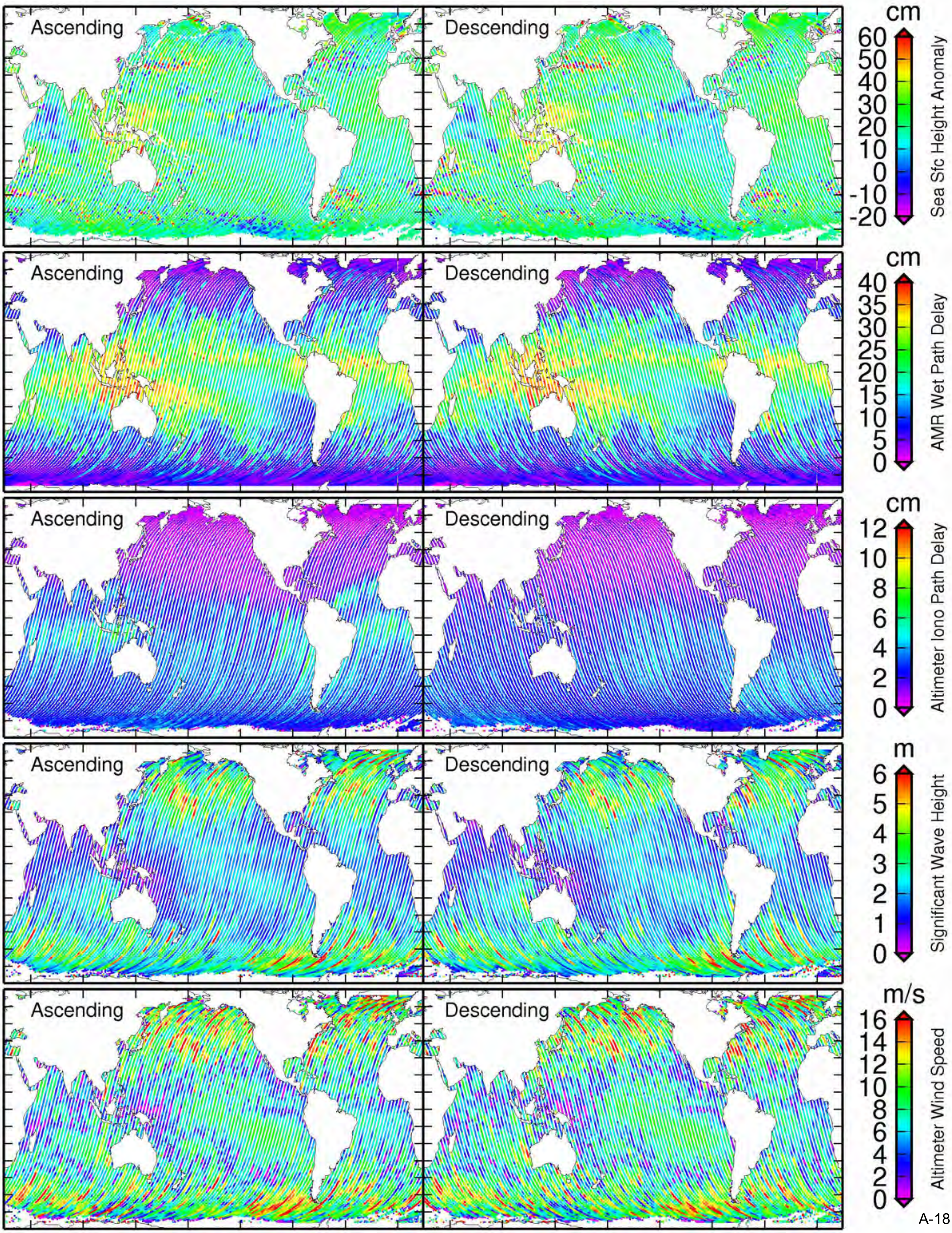

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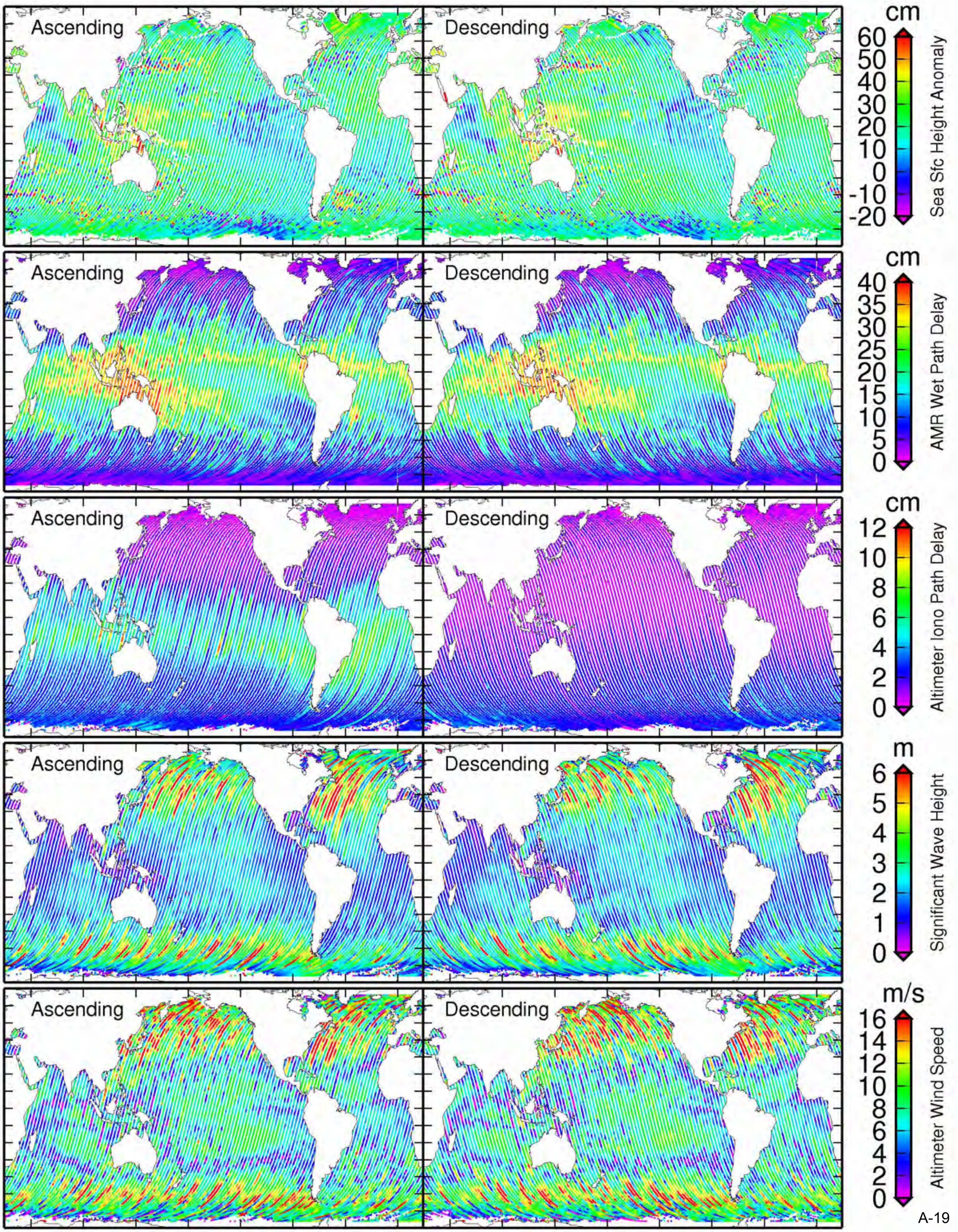

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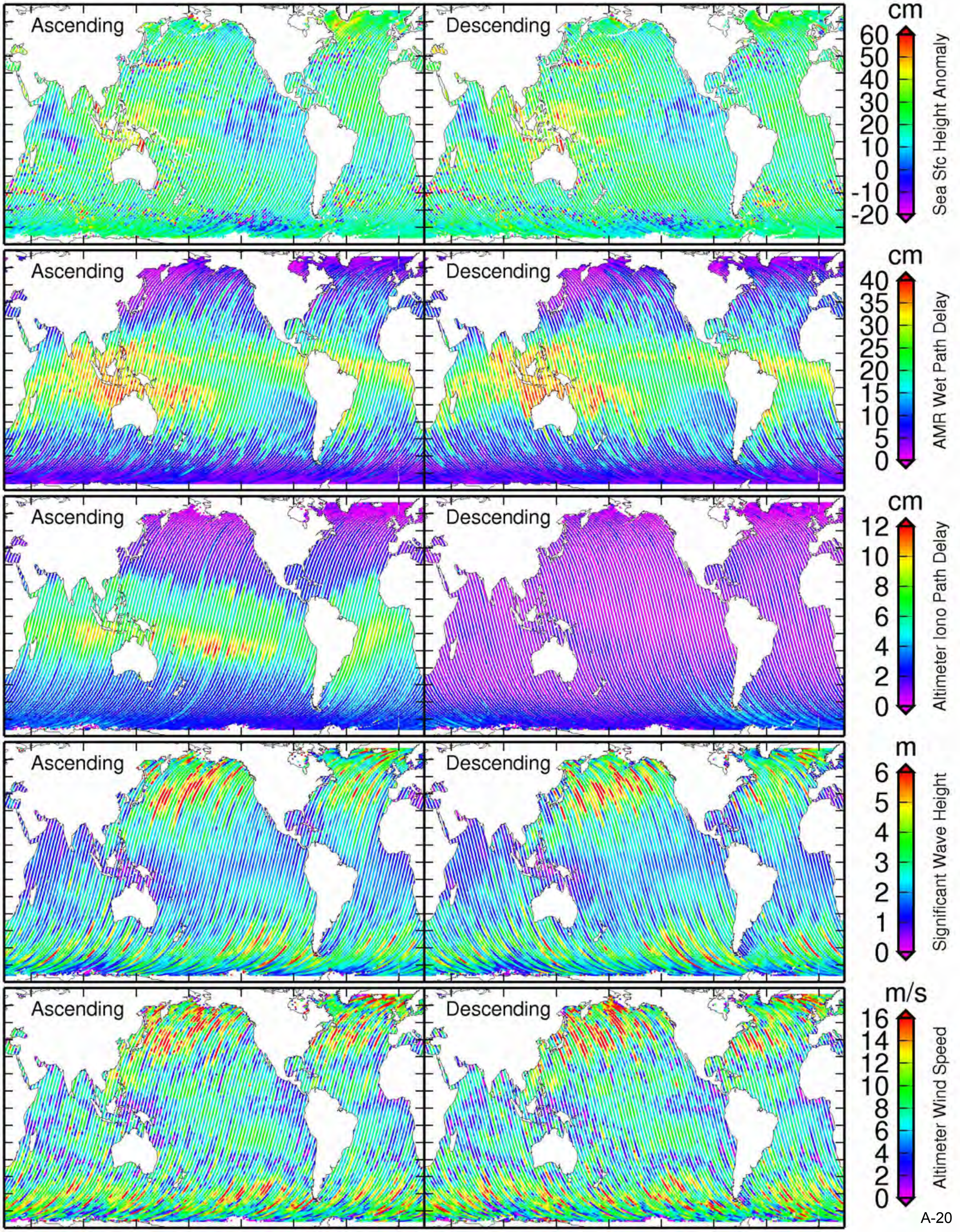

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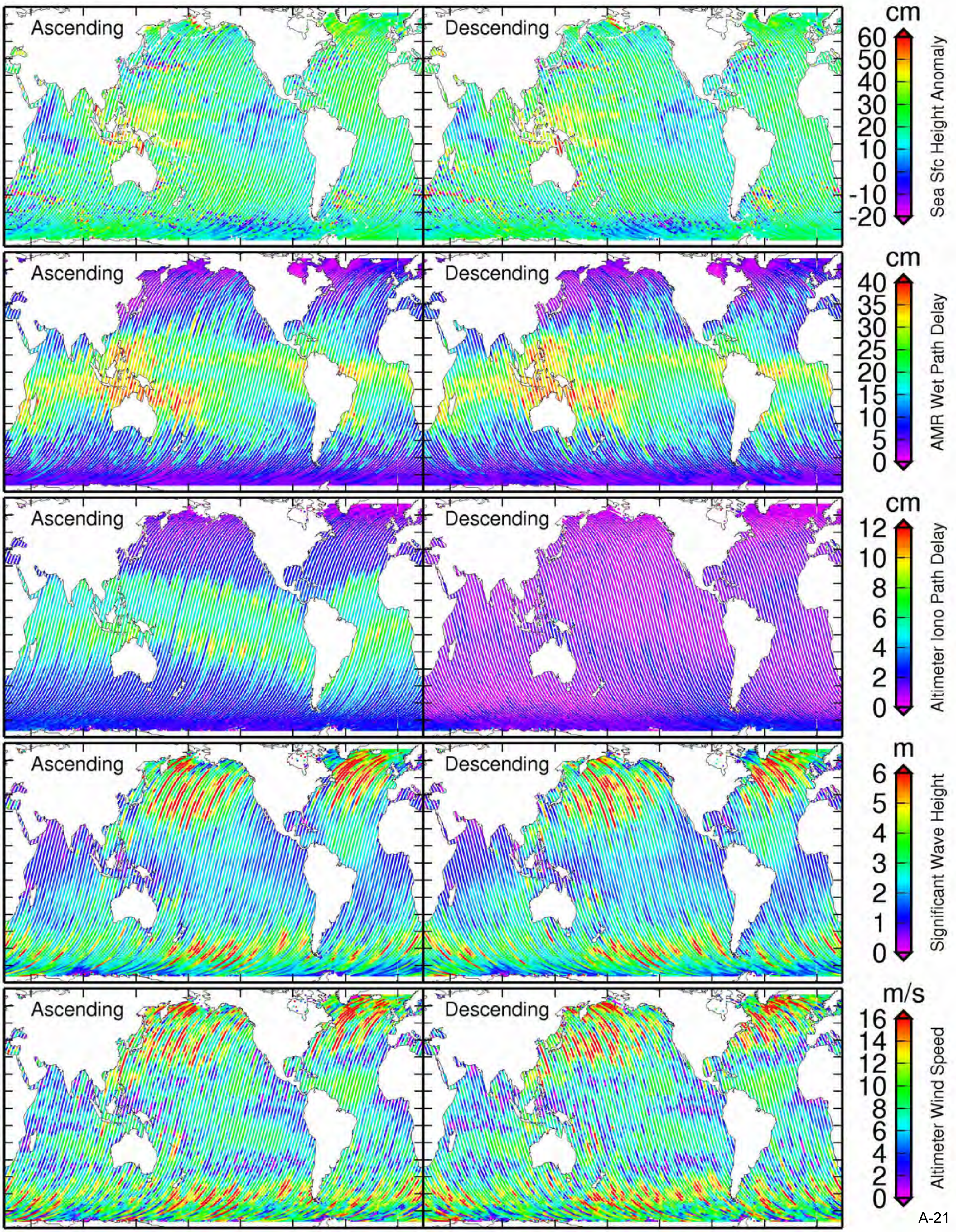

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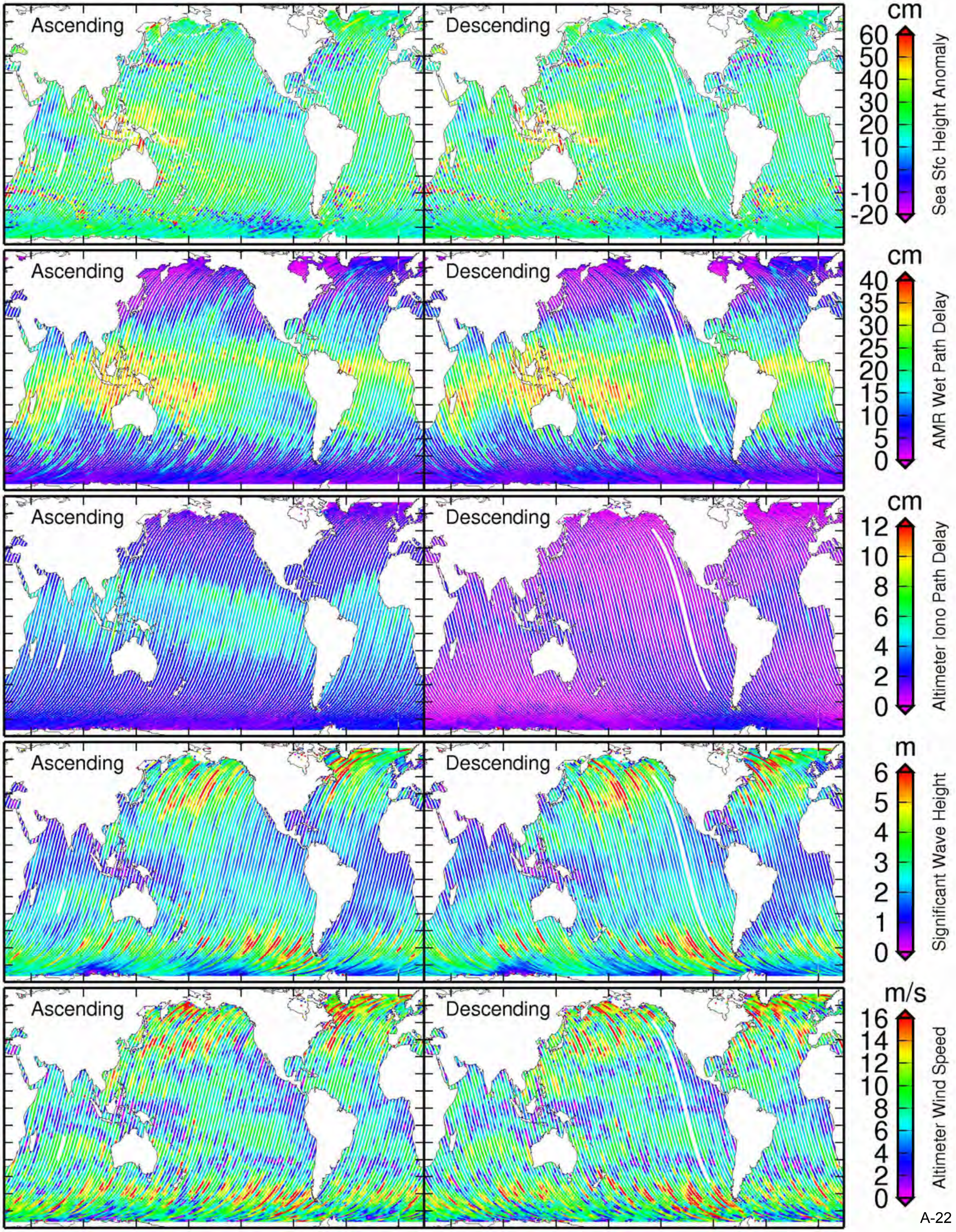

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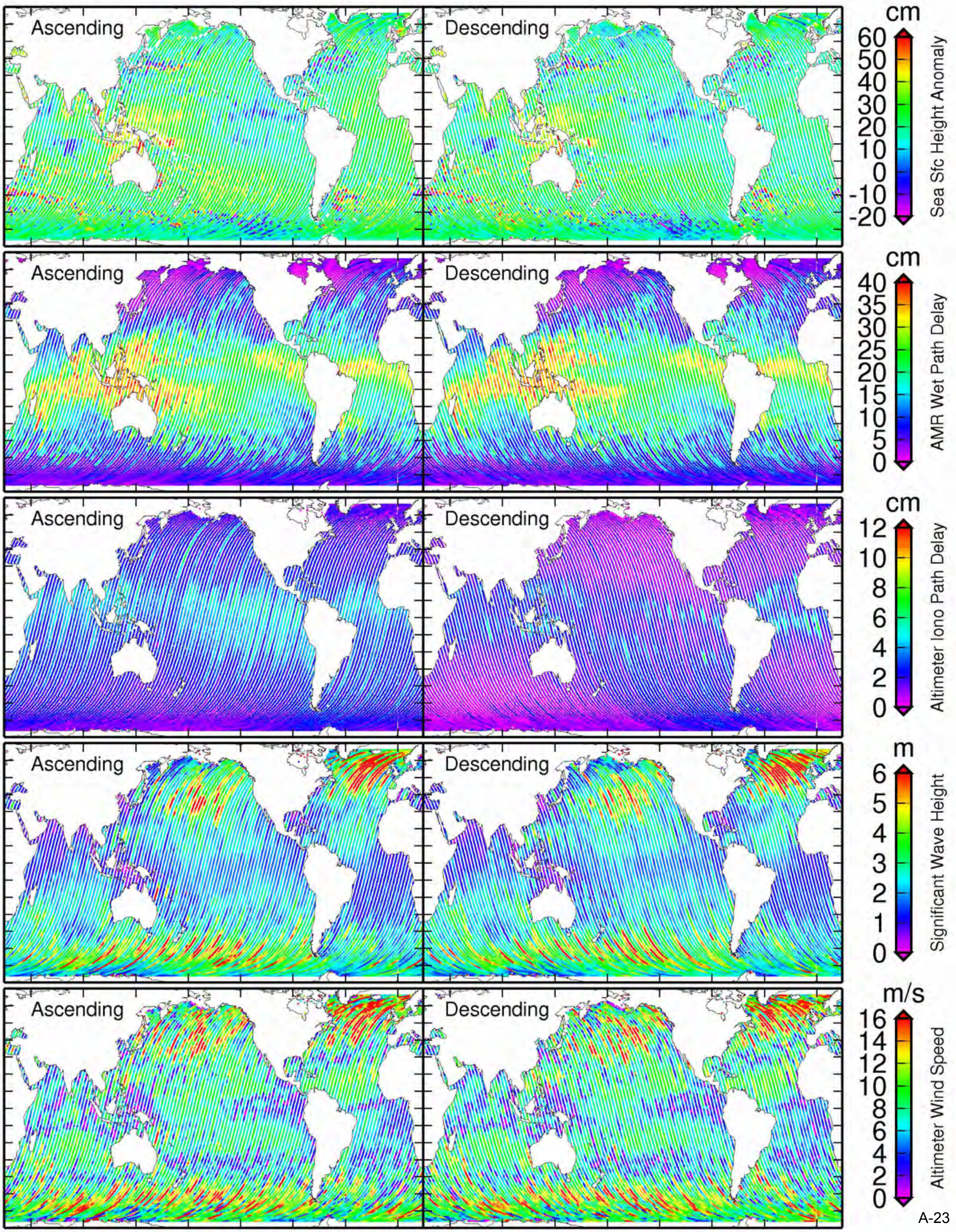

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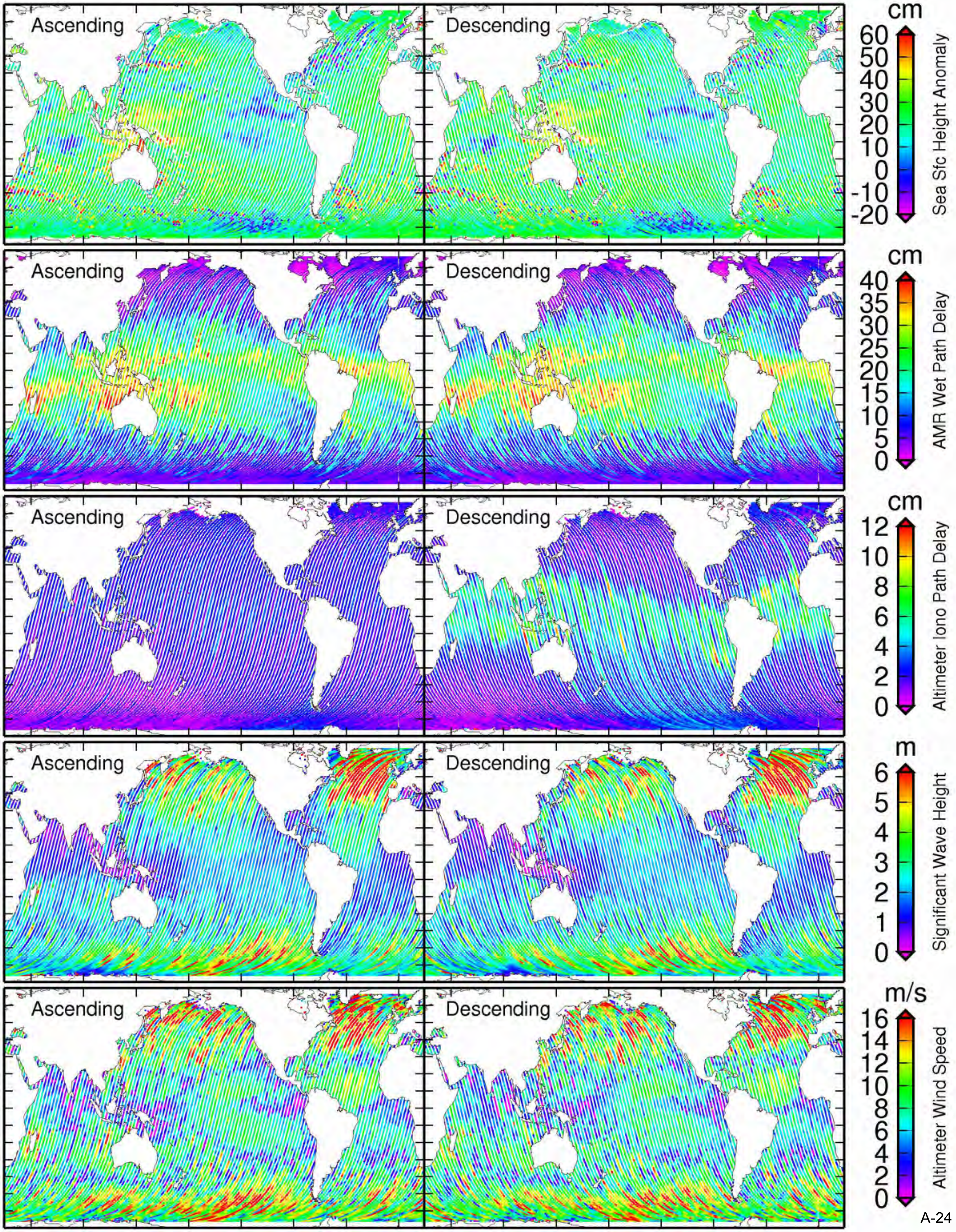

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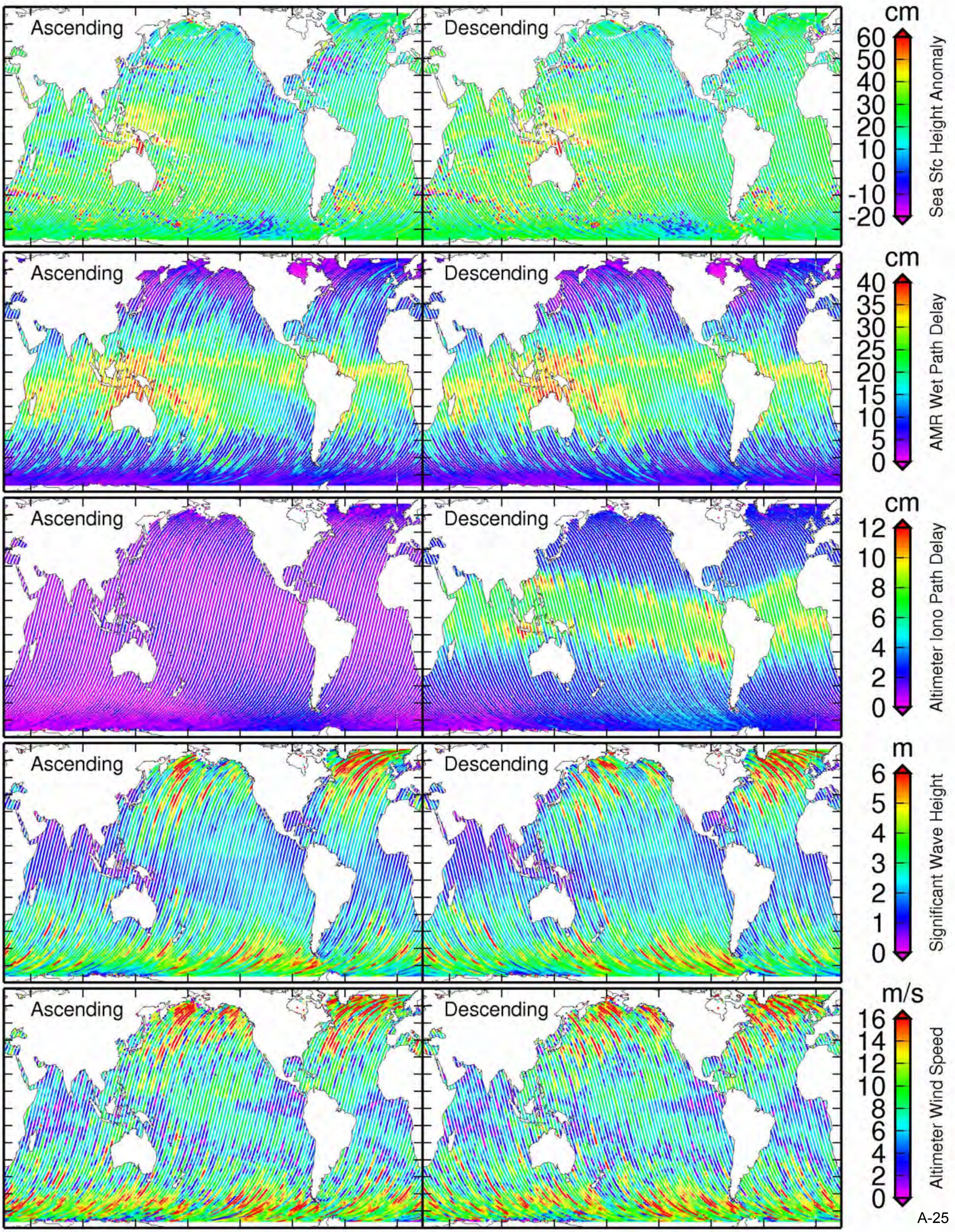

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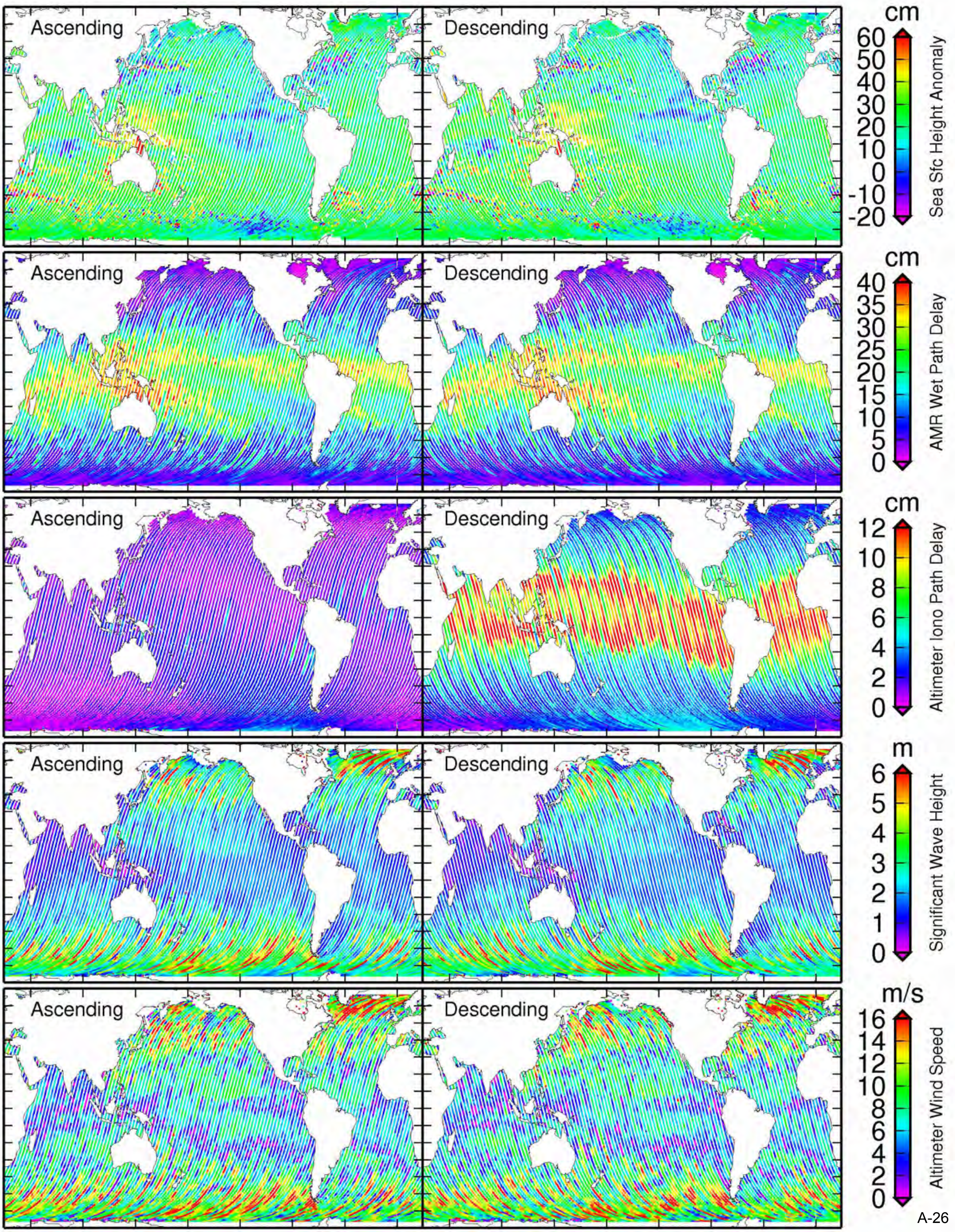

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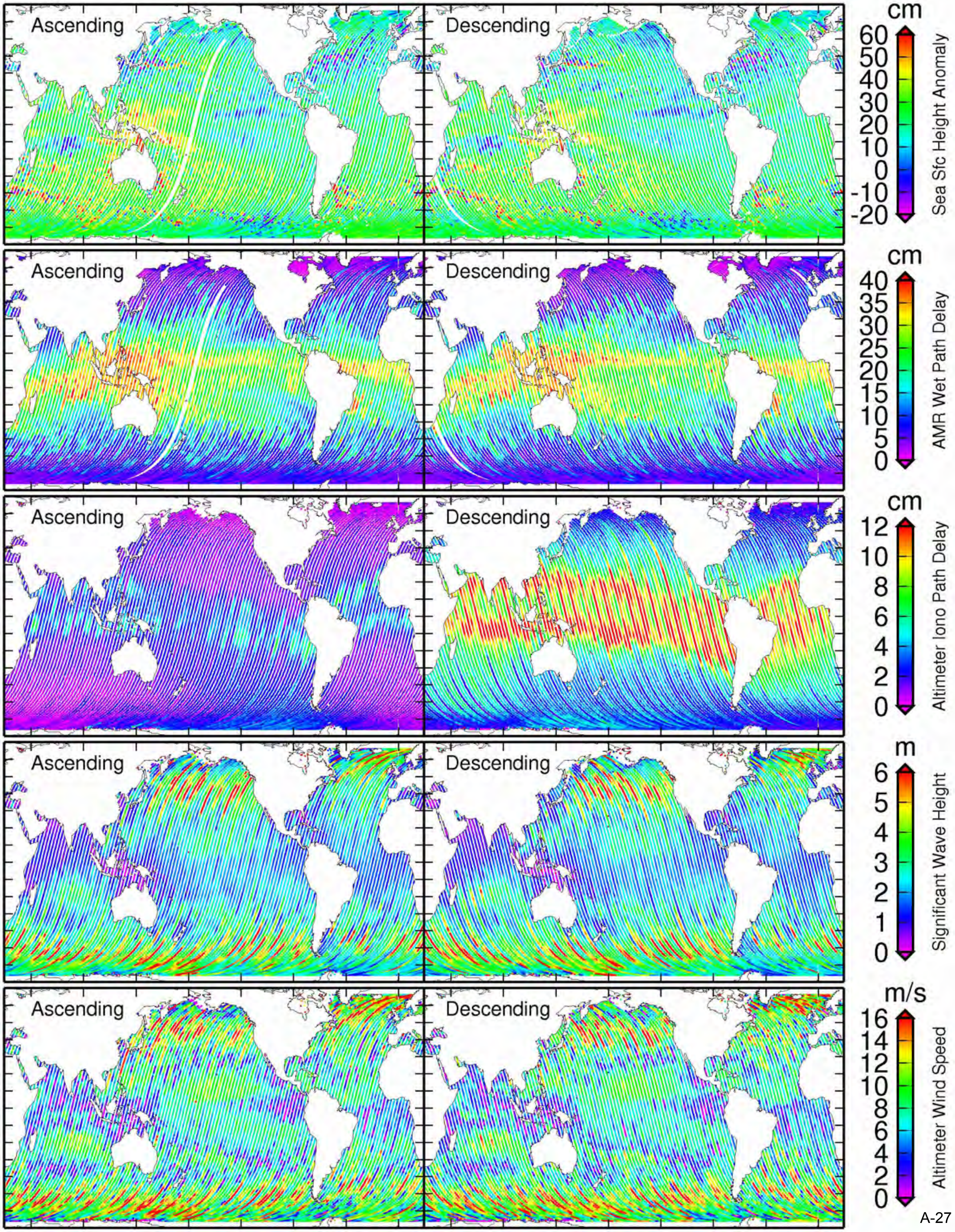

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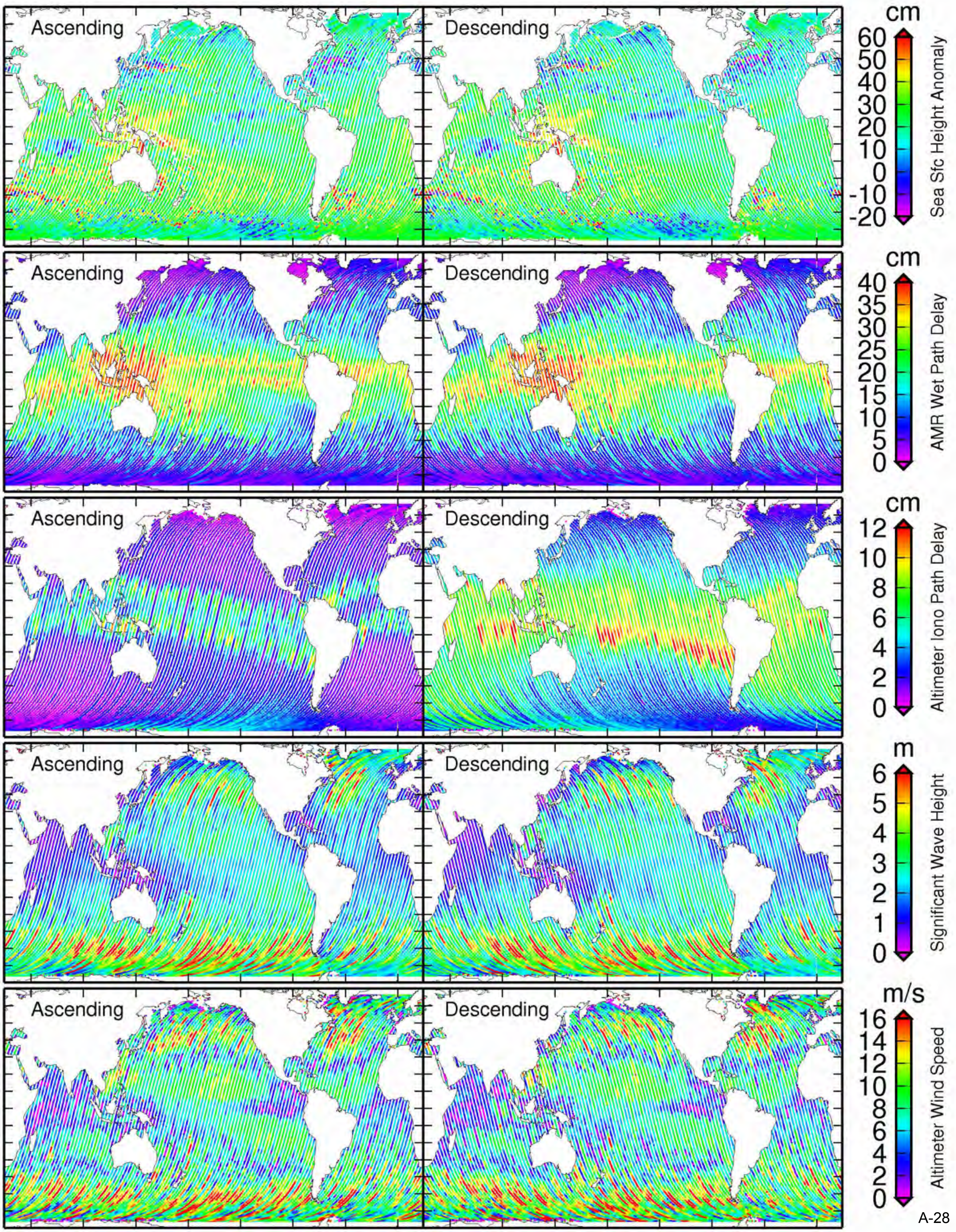

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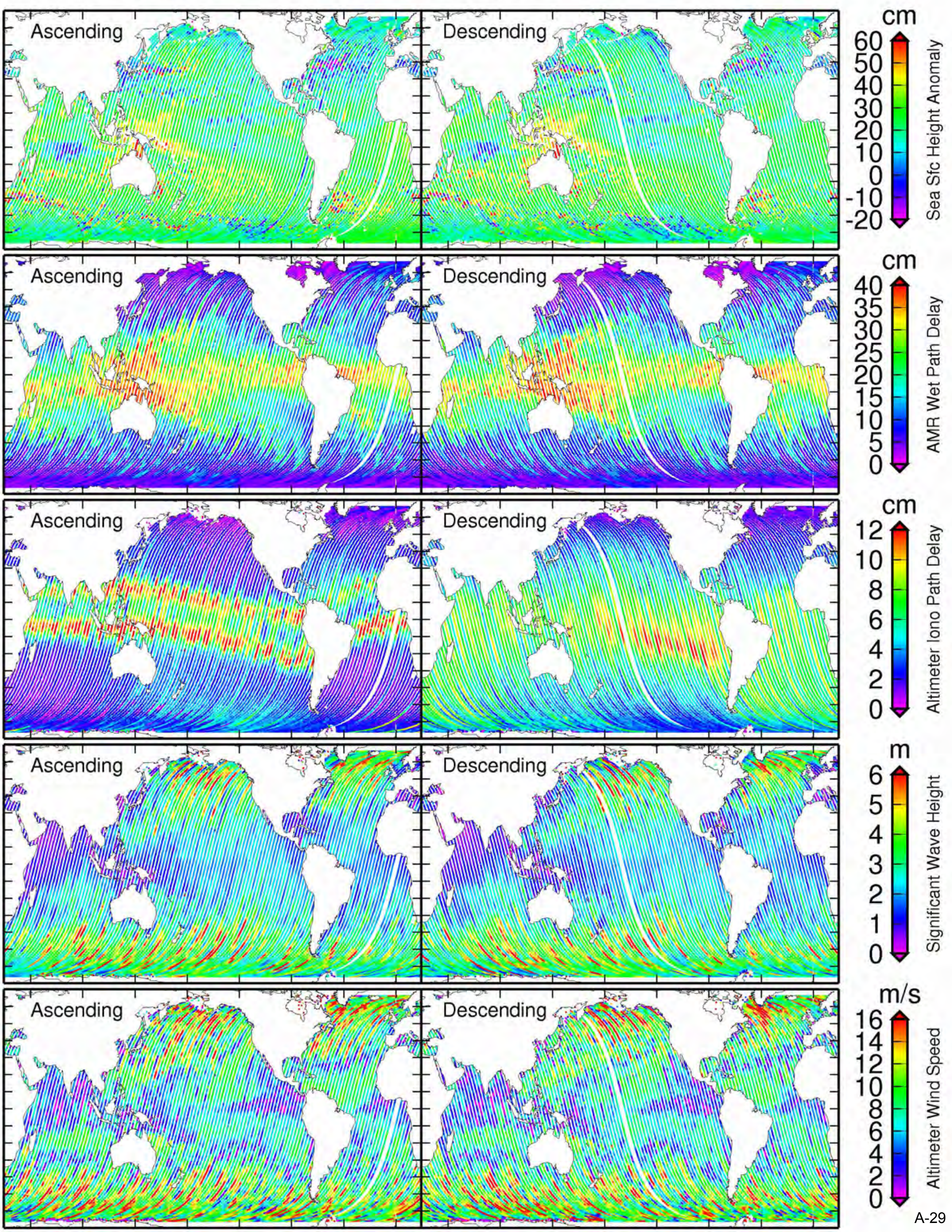

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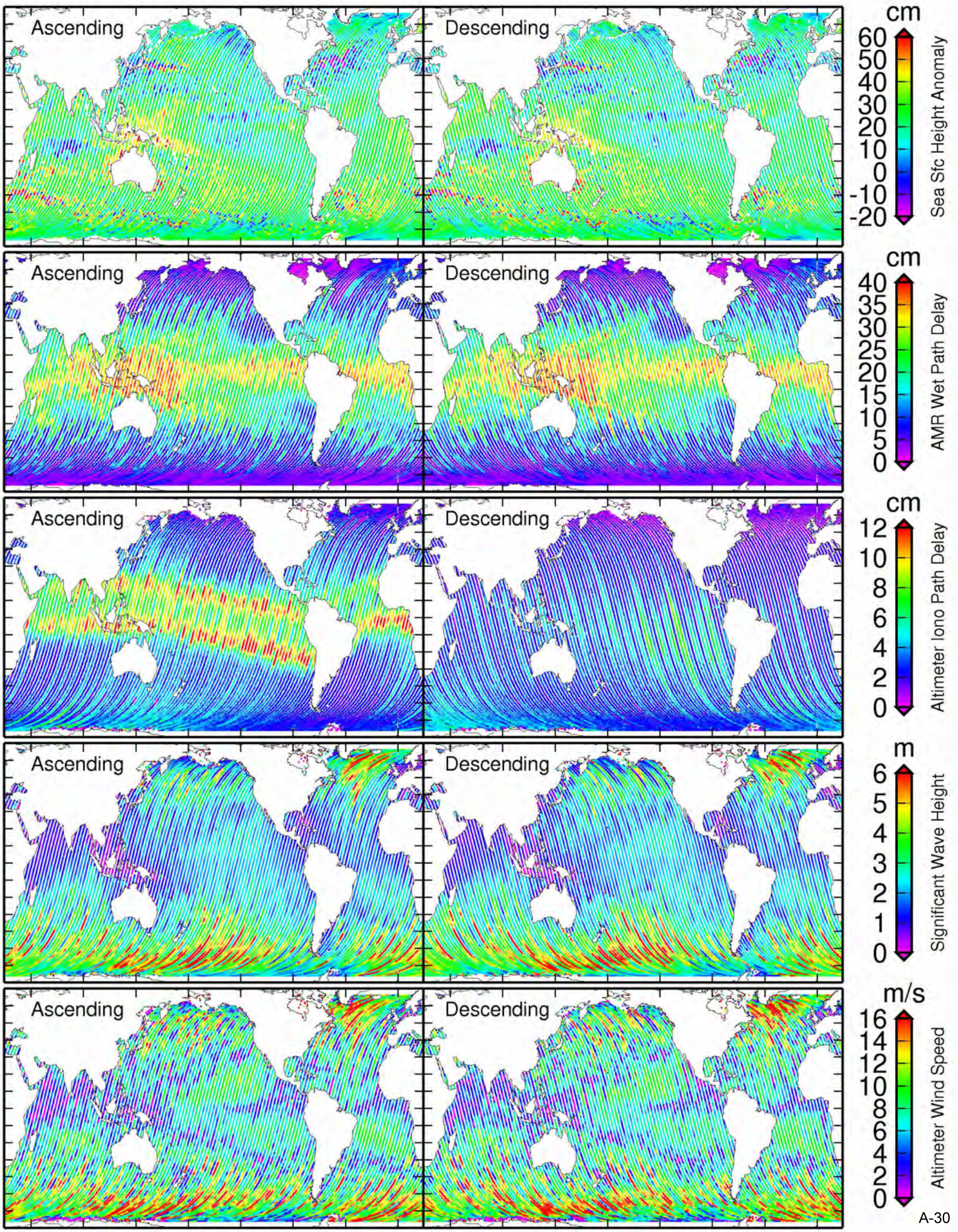

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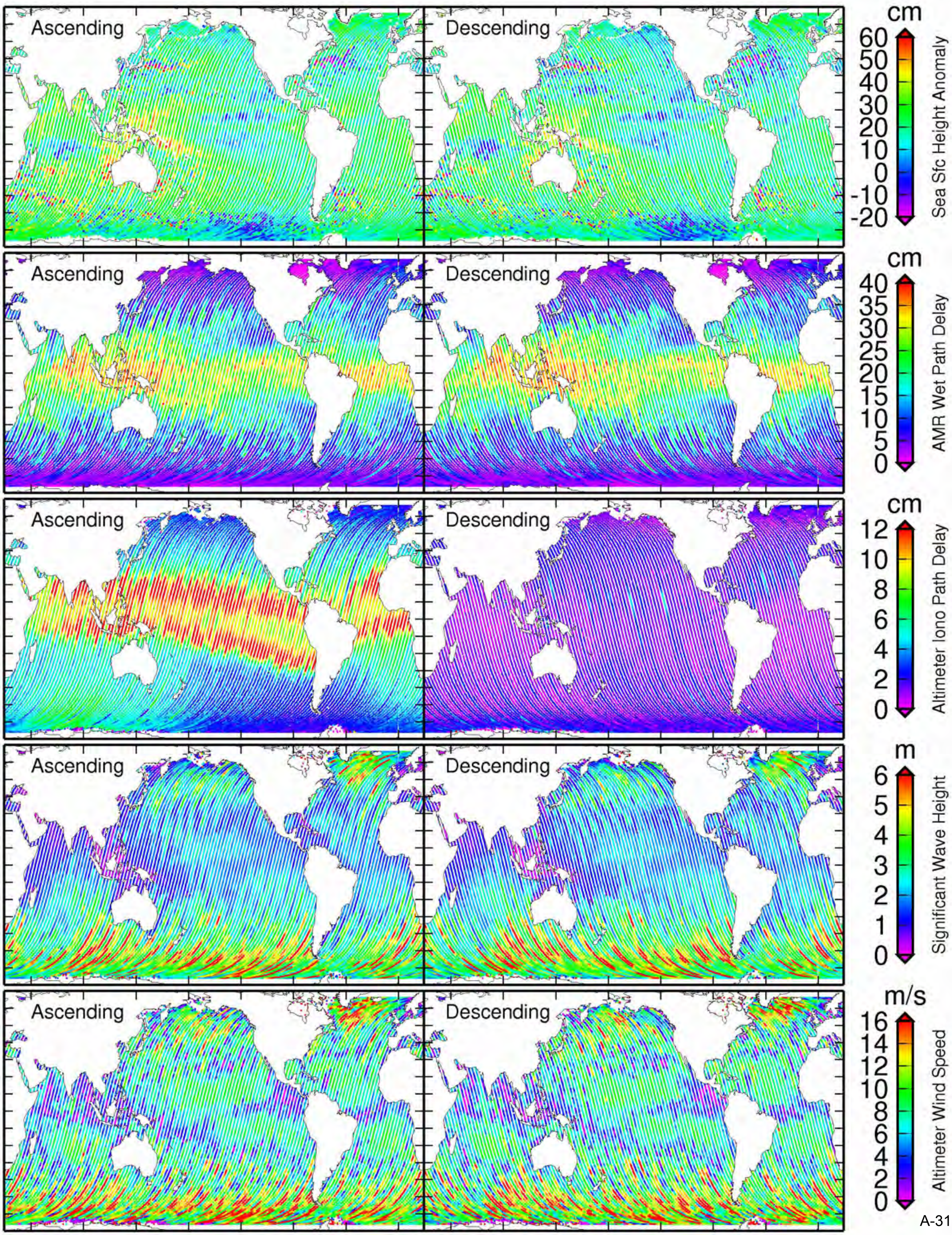

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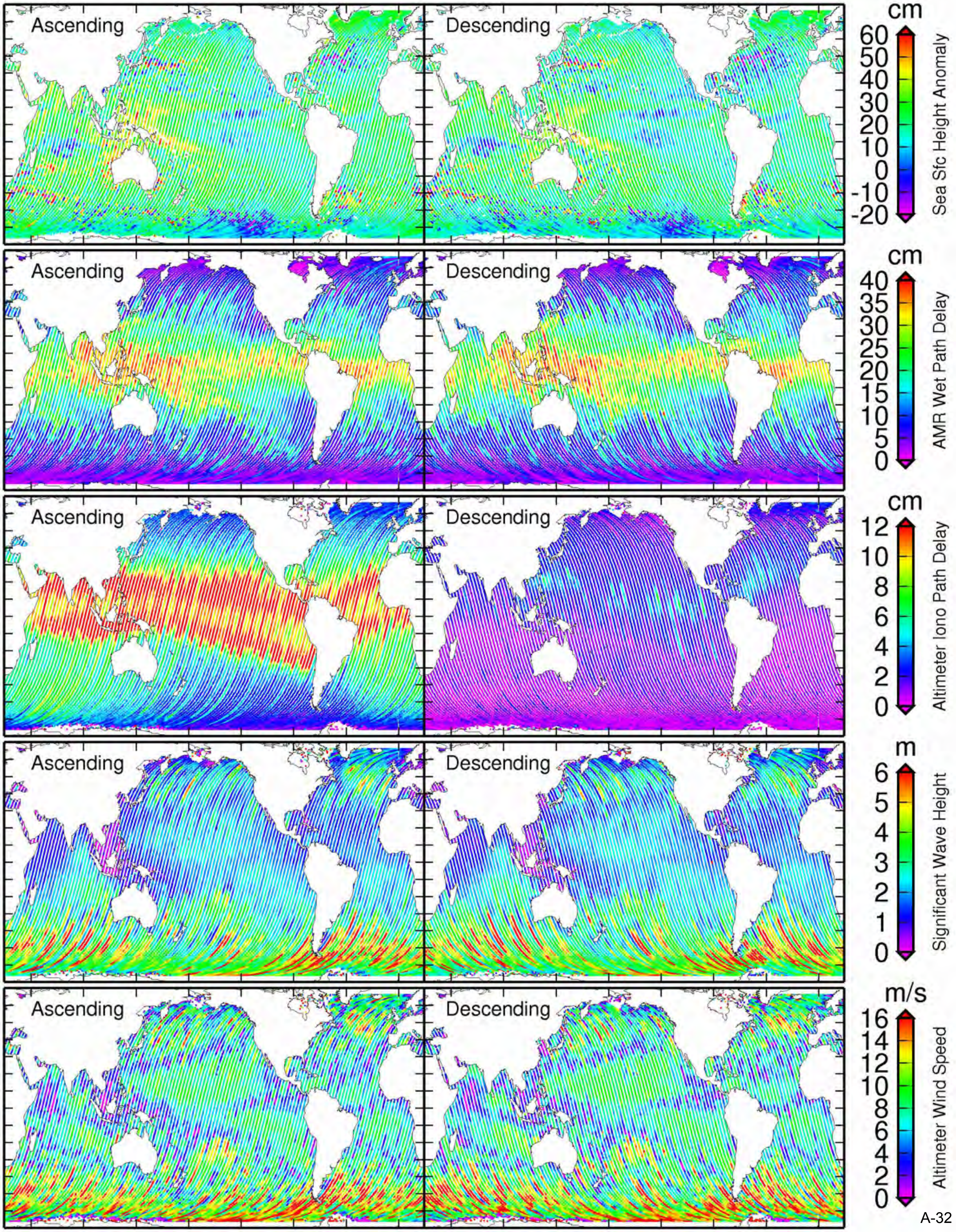

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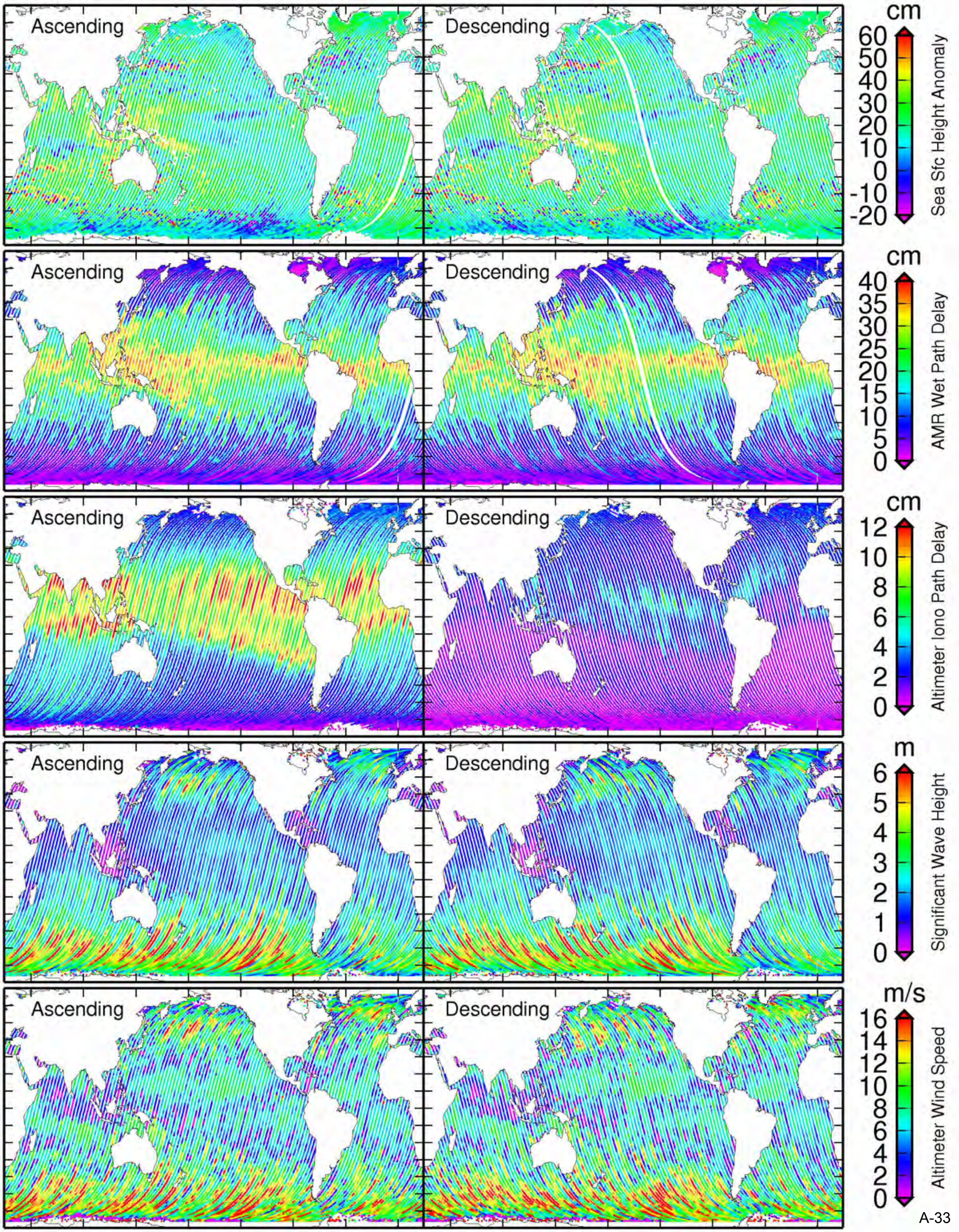

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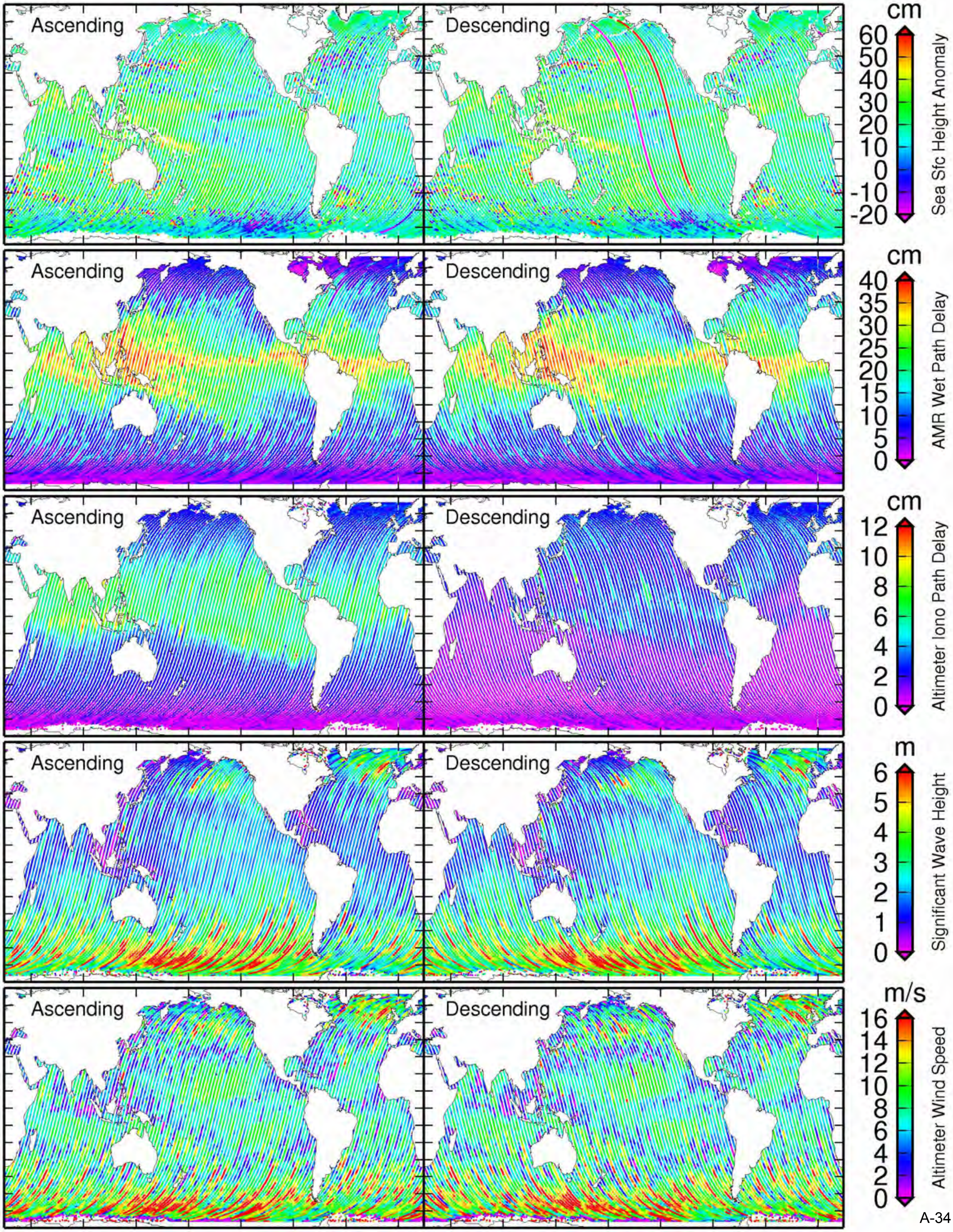

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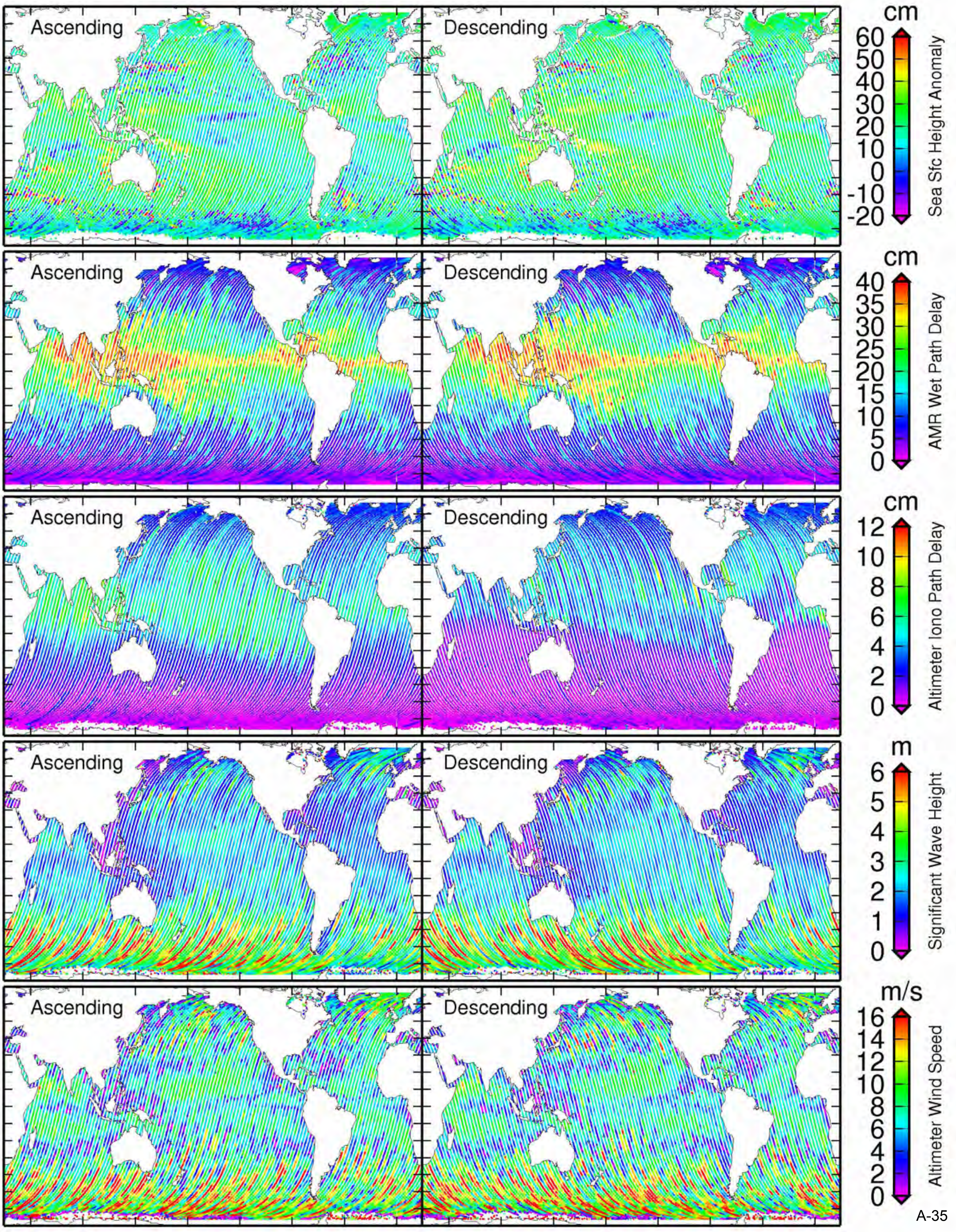

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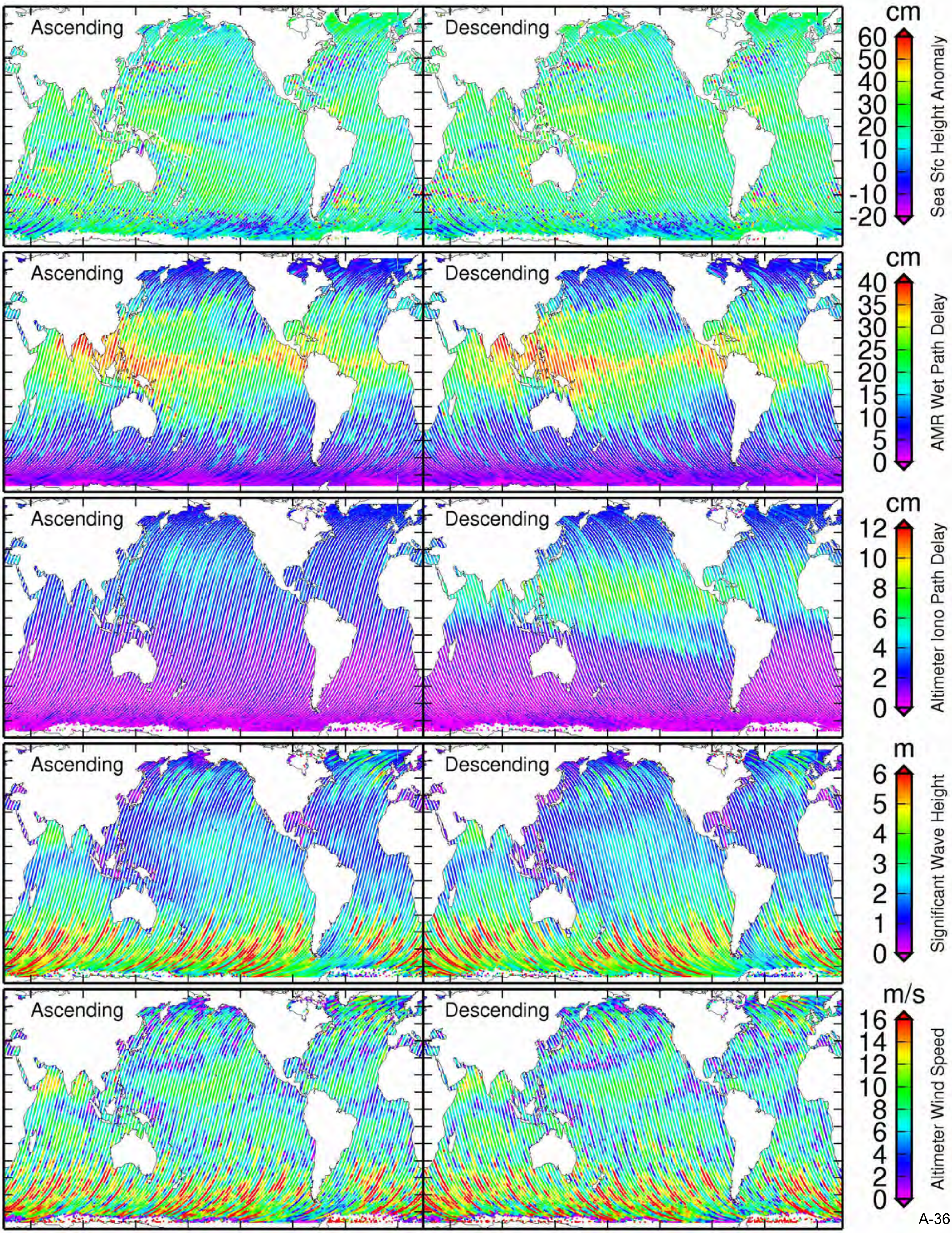

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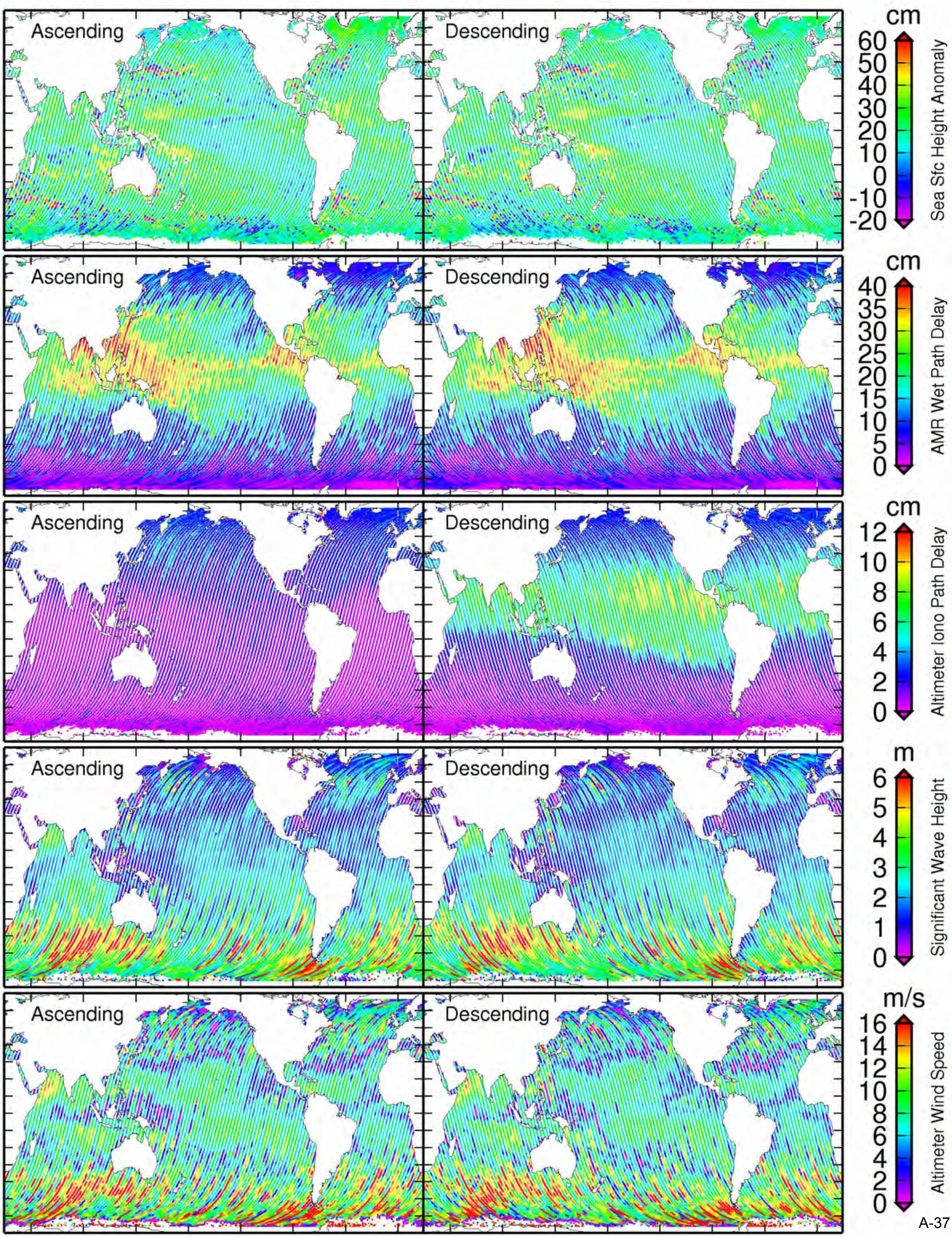

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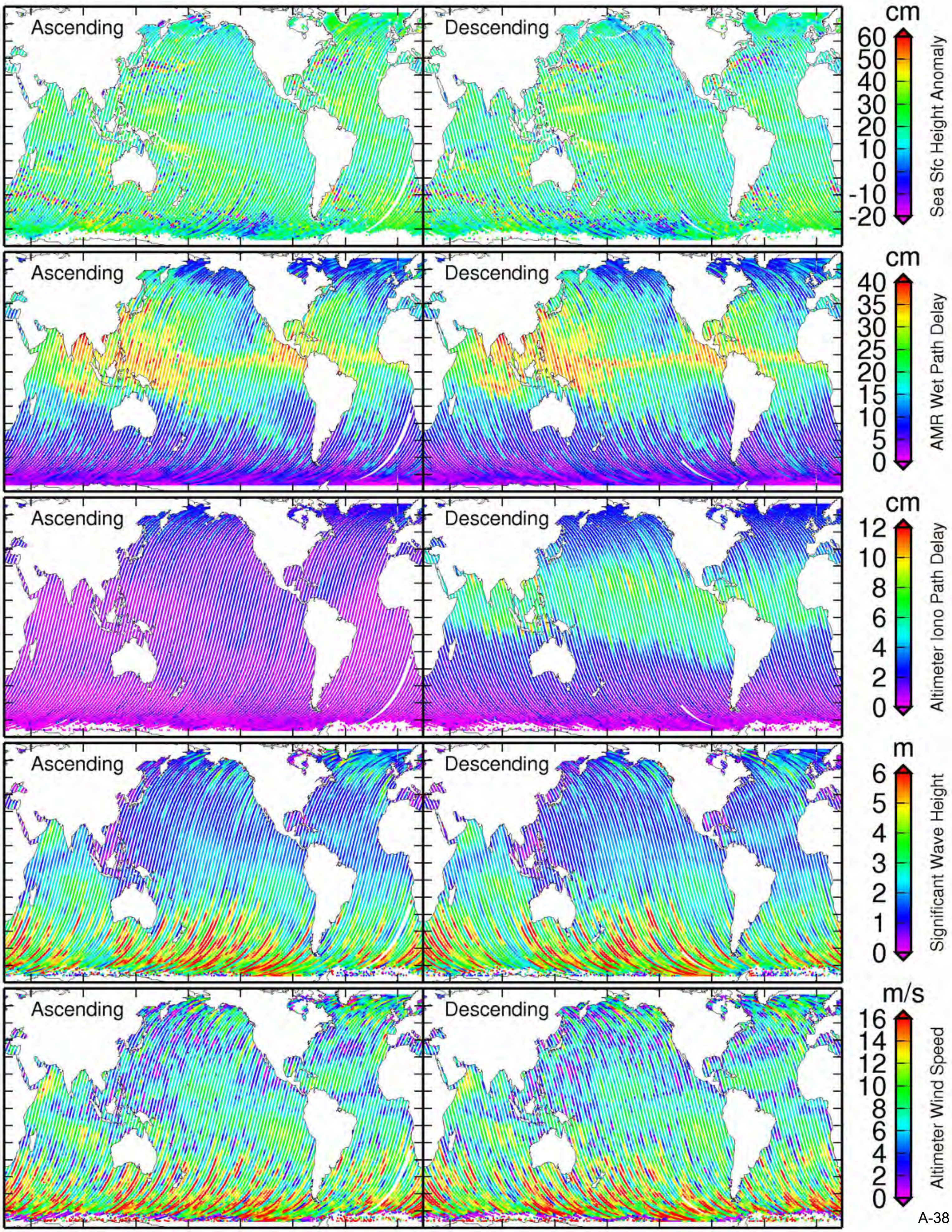

Appendix B. Acronyms

Acronym	Definition
AMR	Advanced Microwave Radiometer
CLS	Collecte Localisation Satellites
CNES	Centre National d’Etudes Spatiales
CNG	Consigne Numerique de Gain (altimeter gain calibration)
DEM	Digital Elevation Model
DORIS	Doppler Orbitography and Radiopositioning Integrated by Satellite
ECMWF	European Centre for Medium-Range Weather Forecasts
EUMETSAT	European Organisation for the Exploitation of Meteorological Satellites
GPSP	Global Positioning System Payload
J2TCCS	Jason-2 Tele-Command and Control System
JPL	Jet Propulsion Laboratory
NASA	National Aeronautics and Space Administration
NESDIS	National Environmental Satellite Data and Information Service
NOAA	National Oceanic and Atmospheric Administration
NRTAVS	Near Real-Time Altimeter Validation System
OGDR	Operational Geophysical Data Records
OSTM	Ocean Surface Topography Mission
SOCC	Satellite Operations Control Center
SSH(A)	Sea Surface Height (Anomaly)
SWH	Significant Wave Height
TM-NRT	Telemetry analyzer Near Real-Time