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Some PBL revelations from satellite observations

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The microwave scatterometers, radiometers, SARs and altimeters have now provided nearly three decades of inferred surface winds over the oceans. These data have been extensively studied and compared to in situ measurements so that they comprise a 'surface truth' base comparable to other sources of winds. In fact, in many cases these products are revolutionary, changing the way we view the world. Examples are:

*The numerical global models of the 90s were inadequate in representing Southern Hemisphere and tropical weather systems.

*Capturing storm and frontal dynamics require at least 25-km resolution. New revelations are intrinsic.

*There is evidence that the secondary flow characteristics (Rolls or Coherent Structures) of the nonlinear PBL solution are present more often than not over the world's oceans.

*The revealed dynamics of the typical PBL indicate that K-theory models are physically incorrect.

*The nonlinear solution applied to satellite surface winds provides sufficient accuracy to determine surface pressure fields from satellite data alone.

*The global climatology surface wind record is too low by 10 – 20%.

The conclusions from these observations are important yet often ignored by the modeling community.