

**P7     Improving the characteristics of the surface roughness over shallow waters**

**Jimenez, Pedro A.**, *Center for Energy, Environment, and Technology (CIEMAT), Spain*; and **Jimy Dudhia**, *National Center for Atmospheric Research*

The roughness of the ocean is mainly controlled by the wave field which is in turn determined to a large extent by the wind. In general, the ocean surface is rougher for increasingly higher winds. Over the open ocean, a modified version of the Charnock relationship provides a good representation of the feedback between the wind speed and the surface roughness. However, data from field campaigns have revealed that over shallow waters the roughness of the ocean is higher than the corresponding values over the open ocean. In spite of this differentiated behavior, our atmospheric models apply the same drag formulation regardless of the depth of the waters. Here we show that an alternative formulation is necessary to adequately reproduce the atmospheric evolution over shallow waters. In particular, we found that increasing the surface drag is necessary to reconcile model results with observations of the wind profile within the first 100 m of the atmosphere. The formulation herein proposed consist of a linear relationship between the wind and the logarithm of the aerodynamic roughness length supported by observations acquired during the Humidity Exchange Over the Sea (HEXOS) program. Our results demonstrate the necessity of introducing a different representation of the surface drag over shallow waters from the one over the open ocean; this being the first modeling evidence supporting the increase of the ocean roughness found in the field campaigns.