



Forward atmospheric modelling to correct for water vapour delays to InSAR ground deformation measurements over mountains

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We are working towards a method that will allow the water vapour delay noise inherent in differential InSAR to be explicitly removed. Our concern is with mountainous areas where the problem is emphasised by the surface intersecting the stratified water vapour field and where horizontal gradients develop due to wind flow divergence and convergence. We use the UK Met. Office's Unified Model (UM) in nested mode to forecast the water vapour field in the area of interest, in our case the 3.3 km high volcano Etna, at the time of the acquisition of the Envisat ASAR radar images used to form the interferograms. During daytime passes of the satellite, the MERIS instrument collects simultaneous vertically integrated water vapour content measurements that we use to validate the UM water vapour results. High degrees of per-pixel correlation between the MERIS and UM values are seen in cloud-free conditions. However, we are aware that the timing of the model initialisation data during frontal conditions is a problem as is the surface soil moisture representation. We present validity results and interferogram corrections for 2004/5 over Etna.