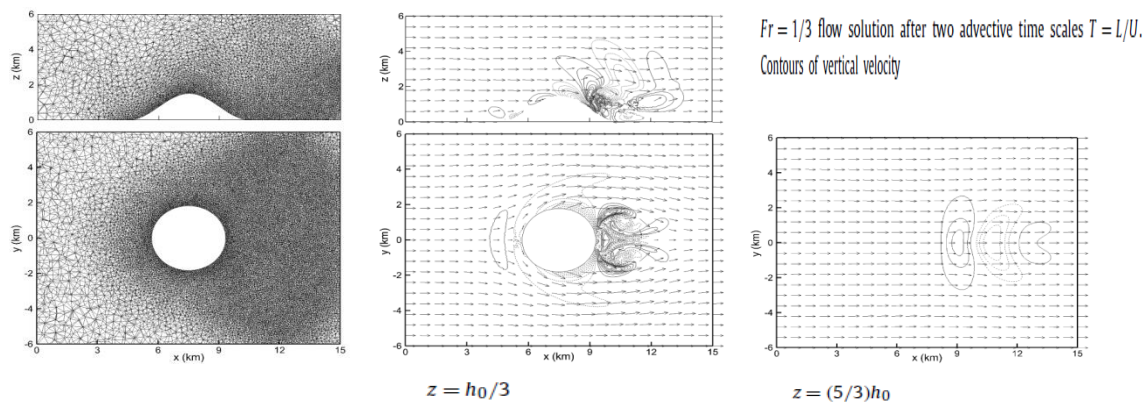


A short research visit from Loughborough University to the European Centre for Medium Range Weather Forecast (ECMWF) took place on the 24<sup>th</sup>-28<sup>th</sup> April 2017. Scientific discussions identified a possible alternative spatial discretisation which is suitable for implementation within the non-hydrostatic atmospheric dynamics Finite Volume Module (FVM) currently under development at ECMWF. The proposed discretisation would employ a compact stencil for evaluating second order derivatives in the selected routines of the non-oscillatory forward in time MPDATA class of methods operating on fully unstructured meshes, which forms the foundations of the FVM module. Methodologies utilising hierarchical meshes employed in the context of the multigrid preconditioning were also discussed. The resulting ideas will be included in the currently planned proposal within the Horizon 2020 scheme. The visit provided also an opportunity for J. Szmelter to give a seminar entitled “Non-oscillatory Forward-in-Time Unstructured-Mesh Models for Fluid Flows” <https://www.ecmwf.int/en/learning/seminars>, which contributed to the ECMWF’s ongoing educational programme and was aimed at ECMWF scientific community.



The central,  $y = 0$ , vertical cross-section (top) of the tetrahedral mesh;  
horizontal cross-section (bottom) of the mesh at the elevation  $z = (1/3)h_0$

An example of computational mesh and predicted flow features for a strongly stratified flow past a steep 3D hill.