



A regional coupled atmospheric-ocean model suitable for hydrological studies

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Comprehensive hydrological studies even on the regional scales (continent or sub-continent size) should be addressed using coupled atmospheric-ocean model. This equally applies for the shorter time scale month-decadal and for regional climate studies. It would be desirable to have river routing sub model present also but we start with just ocean and atmosphere components (OC and AC in the further text). Recently Dr. Janjic has developed comprehensive multi-scale (in the space domain) atmospheric model. It is a sigma coordinate model on B-grid with comprehensive physics. Regarding the hydrological studies it should be mentioned its surface scheme that has multilayer structure (the specific setup depends on the processes examined). It models the snow and has variable number of layer in the snow cover itself. Model covers spatial scales of several hundreds of meters to global with very limited changes of its parameters. Actually the only change is in the treatment of moist processes (moist convection). It is a very efficient yet fully non-hydrostatic model and therefore very suitable for longer integrations. Another important characteristic that is trivial to transform it to full global model. Our ocean component for the time being is POM, The Princeton Ocean Model. Both components are written for use on parallel computers. In construction of a coupled model spatial care should be taken in construction of coupler, part of the model through which information's are exchanged between AC and OC. In order to guaranty exact conservation of the exchange of energy we have divided each atmosphere grid cell into four ocean grid cells. Since AC is on the B-grid and OC is on the C-grid that was easy to achieve. Finally we present several integrations for different time scales for the Mediterranean domain, which was of special interest when we were designing the system.

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