



## **Future flood hazard and regional climate modeling: an integrated hydrological and hydraulic approach**

Rita Nogherotto, Adriano Fantini, Francesca Raffaele, Erika Coppola, and Filippo Giorgi  
The Abdus Salam International Centre for Theoretical Physics, Earth System Physics Group, Trieste, Italy  
(nogherotto@gmail.com)

Future projections of climate show a worldwide change in the frequency, distribution and intensity of rainfall events, whose impact on fluvial flooding is receiving considerable scientific and political interest. In this work we show the preliminary results of an integrated hydrological and hydraulic modeling approach aiming at investigating how the projected changes affect the distribution of floods over the Italian territory, assessing the future flood hazard under projected climate scenarios. River discharges are obtained through the hydrological model CHyM driven by the regional climate model RegCM4 at 12 km resolution under different future RCP scenarios. The discharges are used to produce Synthetic Design Hydrographs (SDHs) for different return periods, which are processed by the CA2D\_par hydraulic model. Flood hazard maps are created for the mid-century (2020-2050) and end-century (2070-2100) time slices and compared to the present day (1976-2005). Projected changes are noticeable for both time slices over all the Italian river network, but are more evident for the smaller basin on the eastern coasts of the Italian peninsula.