Geophysical Research Abstracts,
Vol. 11, EGU2009-9943-1, 2009
EGU General Assembly 2009

New trends in flood hazard mapping in dense urban area

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Definition of flood risk maps in dense urban area is a task to which modern surface hydrology addresses a substantial research effort. New methods for the definition of flood prone area, based on investigation of water depth and flow velocity, have been recently proposed. Two main issues are here investigated: first, the definition of design hydrograph, and second, the choice of the hydraulic model to simulate the 2D inundation process.
A new approach for the definition of the design hydrographs is investigated. In fact, if the objective of the analysis is to assess the maximum extent of flooded area, one possible strategy is to assume the design hydrograph that maximizes the inundation volume, respect to the classical design hydrograph that maximizes the peak discharge.
Two modelling approaches are compared, one based on truly 2D finite difference explicit scheme, and another one based on channel network scheme that makes use of a network of connected channels and storages to simulate flow, respectively, on the streets and into the building blocks.