

Interactive comment on “Hydrodynamics of pedestrians’ instability in floodwaters” by Chiara Arrighi et al.

C. Arrighi

chiara.arrighi@dicea.unifi.it

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Thank you for the interest in our manuscript and for your comments.

An English check will be included, as you suggested, during the final review.

Regarding your comment about the usefulness of the model, I would say that the main contribution of the work is the identification of the most relevant dimensionless actors playing a role in pedestrians instability. The first and most important one is the relative submergence, which accounts for a characteristic of the subject (height) and for a characteristic of the flow (water depth). The second parameter is Froude number, which is an attribute of the flow. Moving from conventional diagrams (water depth versus velocity) to dimensionless diagrams may help in the definition of safety rules for citizens. This doesn't mean that common people should read a dimensional diagram.

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As an example, teaching people to recognize a level of submergence with respect to their body (knees, ankles, waist) is easier than refer to absolute water depths, which are more difficult to assess. This point will be better clarified in the manuscript during the review process.

The 3D numerical model introduced in the paper is affected mostly by the assumption of the rigid body as explained in the comparison between the numerical results of human subjects and human model. Since turbulence is not modelled for the absence of adequate calibration/validation phase for the coefficients of the closure model, the parameters involved are water viscosity, gravity and mesh size. Therefore the effect of the mesh size has been evaluated. Again, it is necessary to mention that the purpose of the numerical model is not to evaluate the 'exact' value of the hydrodynamic forces, but to understand their overall contribution over a wide range of flow regimes and submergence levels. If the referee invokes the sensitivity analysis with respect to other parameters such as flow orientation or body build type, this should be left for a comprehensive ad hoc parameter study.

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