Interactive comment on "Multi-objective automatic calibration of hydrodynamic models utilizing inundation maps and gauge data" *by* N. V. Dung et al.

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1D models of river channel flow are widely used in engineering consultancy. In such studies a calibration process is almost invariably conducted. However, this process is not always comprehensive or rigourous enough. To calibrate a model properly it is necessary to carry out runs with a large number of parameter permutations. The computer power required to do this has so far been prohibitive. This has also meant that little attention has been paid to the methods that could be used for this sort of optimisation. This paper represents a sound contribution in this area and as such is

significant for both researchers and practitioners. Some aspects of the methodology require further research, but this is to be expected given that this is an early attempt.

The paper presents a methodology for automatic calibration and applies it in a relatively complex situation. It demonstrates how the use of a master-slave set-up can make the problem computationally tractable. The paper also uses two different objective functions and shows how these can lead to different optimal parameter sets: this point is of interest in the wider discussion of how best to evaluate model acccuracy (depths or flood extent). The paper also uses the outcome of the optimisation process to elucidate interesting aspects of the model and in particular examines the likelihood that incorrect embankment heights have a significant effect on model accuracy.

The paper is well-written and presented. Although the language is clearly non-native there are only a few aspects that give lack of clarity and these are outlined below. The following specific points need to be addressed: - Page 9180, line 2: "constrained" not "constraint"; - Page 9182, line 2: expand "resp."; - Page 9185, line 6: after "e.g." more examples should be given; - Page 9186, line 6: "weighting" not "weighing"; - Page 9186, line 8: "performs" not "perform"; - Page 9194, line 29: "incorrect" not "wrong".