

## Critical review of seminar “Modelling fluvial processes using the finite volume method” by Ernest Bladé

Ernest Bladé presents the key elements of the finite volume method, advantages and disadvantages and examples of its use. Firstly, he gives an overview of the different areas of the modelling; different types of water flow, sediment transport and water quality. He presents the software developed for using this method and explains the physical equations from where the method was derived. The hydraulic characteristics subcritical and supercritical flow are described and good analogies are given. An example is given of how good the model fits reality with a simulation of water restrained by a wall and what happens when the wall is removed. He states the advantages of the finite volume method as being intuitive and conserving natural processes, and explains the challenges of using it. Depth, velocity, time and spatial data are to be considered. Simulations can be done by applying the method to a river and setting the initial conditions, boundary conditions and the Manning roughness. He explains some limitations of the method and how to solve them. In places where the shallow water equations are not valid, it is necessary to substitute with the right equations - examples of simulations with bridges are given. He talks about how sediment transport can also be integrated and shows simulations of erosion and deposition, and suspended sediment with the use of empirical equations. The last area for the application of the method mentioned is the water quality, where it is possible to simply add pollutants as salinity, temperature, oxygen, nitrogen and coliforms to the simulation, and some good visual examples of simulations are given. As a conclusion, he establishes that the finite volume method is very good, and that even more areas can be integrated.

Generally, the seminar is very clear and good explanations with high adaptability are given. Ernest Bladé's preparation seem to have been aiming the wrong crowd and timing, so many things are skipped during the presentation. Nevertheless, he masters to adapt and keeps a good interaction with the crowd throughout the seminar, including descriptive hand gestures and improvised drawings. The power point presentation has minor downsides such as non-consistency, too small figure texts and uncompleted and shifted elements, but it is simple and efficient for the crowd's attention and understanding. Many good examples are given, but to make room for more important explanations, some could have been left out. Ernest Bladé only mentions the finite volume method to model fluvial processes, but for a better perspective and insight, some alternatives would be a good addition. The best thing about this seminar is the good illustrations of simulations and Ernest Bladé's ability to make complicated topics understandable by simple explanations, analogies and contexts.

Overall the seminar is a one-sided appraisal of one method and it's many uses. Ernest Bladé's ability to conduct knowledge and enthusiasm for the topic is very good and you are taught about a resourceful, realistic method in an interesting and easily understandable way.