**Formulation of smoothed-particle hydrodynamics method for turbulent free-surfaceflows** AKIHIKO NAKAYAMA, HIROSHI INOKUMA, Kobe University, KENTA IKENAGA, Toyota Technical Development — The Smoothed Particle Hydrodynamics (SPH) method is proving useful to compute various flows involving large deformation of flow field such as wave breaking and motion of solid bodies in fluids. The effects of turbulent fluctuations that are important in most large-scale flows in engineering and environmental applications have not been studied to the extent and the degree at which conventional simulation methods like Large Eddy Simulation (LES) have been studied. We try to formulate the method as filtering in the moving frame of reference and identify what are exactly the effects of turbulent fluctuations that are not resolved by this smoothed particle representation and show a method of modeling the effects. A few examples of numerical calculation results are presented to show the effectiveness of the proposed formulation.

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