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How do rigid-lid assumption affect LES simulation results at high Reynolds flows? ALI KHOSRONEJAD, ALI FARHADZADEH, Stony Brook University, SBU COLLABORATION — This research is motivated by the work of Kara et al., *JHE*, 2015. They employed LES to model flow around a model of abutment at a *Re* number of 27,000. They showed that first-order turbulence characteristics obtained by rigid-lid (RL) assumption compares fairly well with those of level-set (LS) method. Concerning the second-order statistics, however, their simulation results showed a significant dependence on the method used to describe the free surface. This finding can have important implications for open channel flow modeling. The Reynolds number for typical open channel flows, however, could be much larger than that of Kara et al.'s test case. Herein, we replicate the reported study by augmenting the geometric and hydraulic scales to reach a *Re* number of one order of magnitude larger (˜200,000). The Virtual Flow Simulator (VFS-Geophysics) model in its LES mode is used to simulate the test case using both RL and LS methods. The computational results are validated using measured flow and free-surface data from our laboratory experiments. Our goal is to investigate the effects of RL assumption on both first-order and second order statistics at high Reynolds numbers that occur in natural waterways. **Acknowledgment:** Computational resources are provided by the Center of Excellence in Wireless & Information Technology (CEWIT) of Stony Brook University.

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