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Space-time characteristics of wall-pressure fluctuation in wall-modeled large-eddy simulation GEORGE ILHWAN PARK, PARVIZ MOIN, Stanford University, Center for Turbulence Research — Assessment of wall-modeled large-eddy simulation (WMLES) has always been based on the prediction quality of the mean velocity and Reynolds stresses. Secondary quantities from WMLES, such as wall pressure/stress fluctuations and their spectra received little attention, and they are usually not reported. Since they are directly related to the structural vibration and noise generation from the immersed bodies, identifying to what extent the near-wall pressure/stress field from WMLES can be utilized for the modeling purpose is of great importance. Here the r.m.s. and space-time characteristics of wall pressure/stress fluctuation obtained from WMLES are reported and analyzed for the first time. WMLES of a high Reynolds number turbulent channel flow at $Re_\tau = 2000$ by Park and Moin [Phys. Fluids **26**, 015108, (2014)] is considered for this purpose. The r.m.s wall-pressure fluctuation in WMLES is generally under-predicted owing to the very coarse near-wall resolution, but improves with the mesh refinement. The convection velocity and wavenumber/frequency spectra of wall-pressure fluctuation show qualitative agreement with low Reynolds number data in the literature. Quantitative comparison to the $Re_\tau = 2000$ DNS data will hopefully be presented in the meeting.

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