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Origin of the subpeaks at the Hubbard band edges SEUNG-SUP B. LEE, JAN VON DELFT, ANDREAS WEICHSELBAUM, Ludwig-Maximilians-University Munich — The spectral function of the infinite-dimensional Hubbard model at half filling exhibits a triple-peak structure in metallic phase, consisting of a heavy-fermion quasiparticle peak and lower/upper Hubbard bands. Recent studies using dynamical mean-field theory (DMFT) report that, on top of the triple-peak structure, sharp subpeaks appear at the inner edges of the Hubbard bands, when the system is close to the metal-to-insulator transition [1-6]. However, the origin of the subpeaks has not been clarified yet. Here we propose an effective theory for the subpeaks, and support the theory by DMFT calculations using the numerical renormalization group (NRG) as impurity solver, of one- and two-band models. The dynamics of the particle/hole excitations, expressed as the projections of fermion operators, is the key mechanism developing the subpeaks.

[1] M. Karski, C. Raas, and G. S. Uhrig, Phys. Rev. B **72**, 113110 (2005).
[2] M. Karski, C. Raas, and G. S. Uhrig, Phys. Rev. B **77**, 075116 (2008).
[3] R. Žitko and T. Pruschke, Phys. Rev. B **79**, 085106 (2009).
[4] Y. Lu et al., Phys. Rev. B **90**, 085102 (2014).
[5] F. A. Wolf et al., Phys. Rev. B **90**, 115124 (2014).
[6] M. Ganahl et al., Phys. Rev. B **92**, 155132 (2015).

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