Dynamical cluster approximation and typical medium analysis of systems with off-diagonal disorder[1] HANNA TERLETSKA, CHINEDU EKUMA, CONRAD MOORE, KA MING TAM, JUANA MORENO, MARK JARRELL, Louisiana State University — A proper theoretical description of realistic disordered materials requires the inclusion of both diagonal and off-diagonal randomness. The single-site self-consistent approximation for systems with off-diagonal disorder was constructed by Blackman, Esterling and Berk (BEB) [1]. Being a single-site approximation, the BEB theory neglects all disorder induced non-local correlations. In order to take into account such non-local effects and the effect of off-diagonal disorder,we extend BEB formalism using the dynamical cluster approximation scheme [2]. Also to address the question of electron localization, we generalize our recently developed typical medium dynamical cluster approximation to systems with off-diagonal randomness. In our numerical analysis we perform a systematic study of the effect of non-local correlations and of off-diagonal disorder on the density of states and electron localization. The results of our calculations are compared with the results obtained using the exact diagonalization and the transfer-matrix method. [1] J. A. Blackman, D. M. Esterling, and N. F. Berk, Phys. Rev. B 4, 2412 (1971). [2] M. Jarrell and H. R. Krishnamurthy, Phys. Rev. B 63, 125102 (2001)

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