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Correlated multiplexity in random and co-evolving multiplex networks JUNG YEOL KIM, KYU-MIN LEE, K.-I. GOH, I.-M. KIM, Korea Univ. — Nodes in a complex networked system often engage in multiple types f interactions among them; they form a *multiplex* network with multiple layers that can be interdependent and co-evolve. In many real-world complex systems, such multiple network layers are not randomly coupled but correlated. Such a correlated multiplexity can imprint nontrivial structural correlations in the multiplex network, which in turn can impact the dynamical processes on it. Here we present some recent results on the correlated multiplexity in multiplex networks. First we show how the correlated multiplexity can dramatically alter the giant component properties of multiplex random networks. Secondly we introduce an evolution model of co-evolving multiplex networks by generalizing the well-known Barabási-Albert-type model, to show how the co-evolution of network layers can induce and modulate the degree of correlated multiplexity.

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