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**Florian Klimm\***, f.klimm@gmail.com, and **Gorka Zamora-López, Jonny Wray, Charlotte M. Deane, Jürgen Kurths** and **Mason A. Porter**. *Promiscuity of Nodes in Multilayer Networks*.

Recent advances in the complexity sciences allow the analysis of *multilayer networks*. The question to what extent nodes are similarly important in all layers arises naturally. We define the *promiscuity* of a node as a measure of the variability of its degree across layers in comparison to a random null model.

We show that empirical networks show different promiscuity distributions. Transportation networks, for example, where the layers represent different modes of transportation tend to have a majority of low promiscuity nodes. A few hub nodes with high promiscuity enable the transit between different modes of transportation. The representation of global trade as a multilayer network reveals that country's imports are often very diverse whereas the export of some countries depends extremely on a single commodity. Employing the promiscuity on transcription factor interaction in multiple cell types reveals proteins that are potential biomarkers of cell fate.

Despite its simplicity, the presented framework gives novel insights into numerous types of multilayer networks and expands the available toolbox for multilayer network analysis. (Received September 24, 2017)