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Structural Hamiltonian of the international trade network

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It is common wisdom that no nation is an isolated economic island. All nations participate in the global economy and are linked together through trade and finance. Here we analyze international trade network (ITN), being the network of import-export relationships between countries. We show that in each year over the analyzed period of 50 years (since 1950) the network is a typical representative of the ensemble of maximally random networks. Structural Hamiltonians characterizing binary and weighted versions of ITN are formulated and discussed. In particular, given binary representation of ITN (i.e. binary network of trade channels) we show that the network of partnership in trade is well described by the configuration model. We also show that in the weighted version of ITN, bilateral trade volumes (i.e. directed connections which represent trade/money flows between countries) are only characterized by the product of the trading countries' GDPs, like in the famous gravity model of trade.

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