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Structural Change and Random Graph Models in Global Oil Trade Networks

Using UN Comtrade data on the bilateral trade of crude oil from 1988 to 2025, we examined temporal changes in network centrality measures and modularity. We also compared the oil trade network with several random graph models using 3- and 4-node subgraph profiles and machine learning classification. The oil trade network was consistently classified as a Chung-Lu configuration graph, suggesting that a model based on the degree distribution better matched its subgraph profiles than the other models considered.