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Energy substitution dynamics: a binary logistic model for fossil and non-fossil competition

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This research applies Marchetti's logistic substitution theory to analyze competition between fossil fuels and low-carbon energy sources using global energy consumption data spanning 1965-2023. The study consolidates nine energy sources into two competing categories: fossil fuels (coal, oil, natural gas) and renewables plus nuclear power (solar, wind, hydropower, nuclear, biofuels, other renewables). The research demonstrates that logistic substitution models retain descriptive power for macroscopic energy system analysis.

Technical Track

Nuclear Applications and Radiation Processing

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