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【404】 Quantum backflow within circular geometry

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Quantum backflow (QB) is a counterintuitive phenomenon where a particle's probability density moves against its momentum. Despite being first recognized three decades ago, QB remains largely unexplored, presenting theoretical and experimental challenges. QB still awaits its inaugural experimental observation. In my talk, I will present novel theoretical insights into QB within circular geometry, establishing precise lower and upper bounds for the probability current. Additionally, I will demonstrate that the current-versus-time function associated with states maximizing backflow probability transfer forms a fractal curve with a dimension of $7/4$, potentially offering an experimentally relevant signature near the probability-transfer bound.

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