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**ADILBEK KAIRZHAN**, McMaster University

*Orbital instability of standing waves for NLS equation on star graphs*

We consider the nonlinear Schrodinger (NLS) equation with positive power nonlinearity on a star graph  $\Gamma$  ( $N$  half-lines glued at the common vertex) with a  $\delta$  interaction at the vertex. The strength of the interaction is defined by a fixed real value  $\alpha$ . In the recent works of Adami et al., it was shown that for  $\alpha < 0$  the NLS equation on  $\Gamma$  admits the unique orbitally stable symmetric standing wave, while all other standing waves are asymmetric and were conjectured to be unstable. In this talk, we present the stability analysis of the asymmetric waves for  $\alpha < 0$ . By extending the Sturm theory to Schrodinger operators on the star graph, we give the explicit count of the Morse and degeneracy indices for each standing wave. Based on the count, we prove the orbital instability of the asymmetric standing waves.