Breather solutions on necklace graphs

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We will present the main steps of the construction of real-valued, time-periodic and spatially localized solutions (breathers) of small amplitude of nonlinear Klein-Gordon equations on a periodic necklace graph. Our results builds upon a spatial dynamics ansatz combined with center manifold reduction and bifurcation theory. Spectral gaps in the Floquet-Bloch spectrum of the linearized operator occur in a natural way for periodic necklace graphs and are essential for the construction. The major challenge arises from the irregularity of the solutions due to the Kirchhoff boundary conditions.

References

[1] D. Maier, Construction of breather solutions for nonlinear Klein-Gordon equations on periodic metric graphs, *Journal of Differential Equations*, to appear.