1154-35-493 **Timothy E. Faver*** (t.e.faver@math.leidenuniv.nl) and **Hermen Jan Hupkes**.

Micropteron traveling waves in diatomic Fermi-Pasta-Ulam-Tsingou lattices under the equal mass limit.

The diatomic Fermi-Pasta-Ulam-Tsingou (FPUT) lattice is an infinite chain of alternating particles connected by identical nonlinear springs. We prove the existence of micropteron traveling waves in the diatomic FPUT lattice in the limit as the ratio of the two alternating masses approaches 1, at which point the diatomic lattice reduces to the well-understood monatomic FPUT lattice. These are traveling waves whose profiles asymptote to a small periodic oscillation at infinity, instead of vanishing like the classical solitary wave. We produce these micropteron waves using a functional analytic method, originally due to Beale, that was successfully deployed in the related long wave and small mass diatomic problems.Unlike the long wave and small mass problems, this equal mass problem is not singularly perturbed, and so the amplitude of the micropteron's oscillation is not necessarily small beyond all orders (i.e., the traveling wave that we find is not necessarily a nanopteron). The central challenge of this equal mass problem hinges on a hidden solvability condition in the traveling wave equations, which manifests itself in the existence and fine properties of asymptotically sinusoidal solutions (Jost solutions) to an auxiliary advance-delay differential equation. (Received September 05, 2019)