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**YVONNE ALAMA**, McGill

*On the existence of a periodic solution to a nonlinear ODE using the radii polynomial approach.*

We will give a rigorous computer assisted proof to solve part of a conjecture from Galaktionov and Svirshchevskii on the existence of a periodic solution to a fourth order nonlinear ODE. This ODE is used in the study of flame extinction phenomena in turbulent flows. Our procedure will be to reduce the problem of finding a periodic solution to one of finding a root of a function in finite dimensions. We will then introduce the tools necessary to rigorously prove the existence of a root of that function using the radii polynomial approach in finite dimensions.