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Several uses of Hopf bifurcations in devices, biology and fluids

RANDALL TAGG, University of Colorado Denver — A casual conversation (c1987) with Jerry Gollub about the marginal oscillator detector used in early magnetic resonance experiments launched a fruitful direction of inquiry about Hopf bifurcations by several undergraduates and some graduate students. This includes use of a Wien bridge oscillator as a sensitive detector, uncovering some new features of this well-known circuit including aspects of dynamics on a torus near the initial bifurcation and explorations of noise near the bifurcation. Mention will be made of other perhaps unexpected aspects and potential uses of Hopf bifurcations (or closely related phenomena) in biology and fluids.

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