1131-92-305   **Andrea K. Barreiro*** (`abarreiro@smu.edu`), POB 750156, Dallas, TX 75275. *A geometric method for analyzing operators with low-rank perturbations.*

We consider the problem of finding the spectrum of an operator taking the form of a low-rank (rank one or two) non-normal perturbation of a self-adjoint operator. We use a simple idea of classical differential geometry (the envelope of a family of curves) to analyze the spectrum. When the rank of the perturbation is two, this allows us to view the system in a geometric way through a phase plane in the perturbation strengths. We apply this technique to two problems: a neural network model of the oculomotor integrator (Anastasio and Gad 2007), and a nonlocal model of phase separation (Rubinstein and Sternberg 1992). This is work with Tom Anastasio and Jared Bronski (UIUC). (Received July 17, 2017)