

CHALLENGES FOR VALIDATED NUMERICS IN DYNAMICAL SYSTEMS

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We will present recent work on two intensely studied problems in dynamical systems. The first deals with the discrete quadratic map; here the long-standing question concerns the regions of stability when varying the parameter of the map. The second topic concerns Hilbert's 16th problem, which asks for the possible number (and configuration) of limit cycles for planar polynomial vector fields. Both problems have been thoroughly studied for more than a century, and with a formidable variation of techniques. We will show how validated numerics can contribute to gaining further insight into these problems. This work is joint with Daniel Wilczak and Tomas Johnson, respectively.