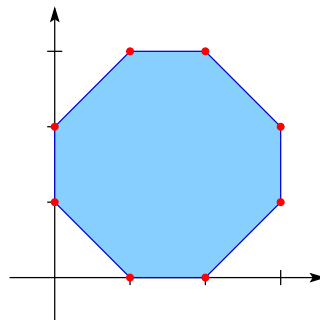


## **Perturbations of the octagon system**

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Semitoric systems have been classified in 2009-2011 by Pelayo & Vũ Ngọc. Since then their properties as well as various examples have been studied by a series of authors. Their bifurcation behaviour, in particular, has been studied in various works by Hohloch & Palmer (2018, 2021), Palmer & Le Floch (2019), De Meulenaere & Hohloch (2021).

In this talk, we will study an explicit family of so-called hypersemitoric systems which are, roughly, ‘semitoric systems with hyperbolic singularities and mild (‘parabolic’) degeneracies’. This explicit family is obtained by perturbing the toric system that has the octagon displayed below as its Delzant polytope.



The toric system generated by this octagon was previously used by De Meulenaere & Hohloch to generate a family of semitoric systems with multiple Hamiltonian-Hopf bifurcations so that one can here nicely observe the difference between semitoric systems and hypersemitoric systems. Moreover, we will more generally look at the perturbations of toric systems and will discuss the problems that arise when trying to construct hypersemitoric systems that way. Furthermore we will show how hyperbolic-regular fibers can generate more complicated fibers via ‘colliding with each other’.

The content of this talk is part of the the speaker’s PhD thesis.