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On the sympletic geometry and topology of (hyper)semitoric systems

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In this talk I present my PhD thesis, where I study the symplectic topology of the fibers of semitoric systems, and introduce new symplectic invariants for simple hypersemitoric systems and simple hyperbolic-regular lines in Hamiltonian S^1-spaces.

First, we generalize McDuff's method of probes, and use this to study the (non)displaceability properties of the fibers of semitoric systems. Furthermore, we prove that any nonsimple focus-focus fiber of a semitoric system is nondisplaceable.

Then, we introduce the affine invariant for simple hypersemitoric systems, generalizing the semitoric polytope invariant of semitoric systems. Furthermore, we introduce a J-height invariant and multiple J-Taylor series invariants for simple hyperbolic-regular lines in Hamiltonian S^1-spaces.