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Singular Lagrangian fibration of a Tavis-Cummings system with an A_2 singularity

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Singular Lagrangian fibrations arising from three-degree-of-freedom integrable Hamiltonian systems remain largely unexplored. While several results describe the global structure of large classes of systems with two degrees of freedom, only a few examples are understood in higher dimensions.

In this talk we present a three-degree-of-freedom system derived from the two-spin Tavis-Cummings model whose singular Lagrangian fibration exhibits a topology that has not been observed in other physical models. In particular, the most degenerate singular fiber is homeomorphic to $S^2 \times S^1$ with a singularity of A_2 type. We describe the bifurcation diagram and the global topology of the fibration, we compute its Hamiltonian monodromy, and we compare it to the Picard-Lefschetz monodromy of the A_2 singularity.