Normal form of swallowtail and its applications

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In this talk, a normal form of swallowtail singularity:

$$(u, v) \to (u, 4v^3 + 2uv, 3v^4 + uv^2) \in C^\infty((\boldsymbol{R}^2, 0), (\boldsymbol{R}^3, 0))$$

will be given. Here a normal form means a reduction of the map-germ using diffeomorphisms on the source, and isometries on the target. A normal form of a singularity in this sense tells us all differential geometric invariants of the singularity. Geometric meanings of some of these invariants and relations with known invariants will be presented. As an application, configrations of geometric foliations near a swallowtail will be expressed.