

**Fukuda, T.; Janeczko, S.**

**Hamiltonian systems on submanifolds.** (English) [Zbl 1425.53096](#)

Izumiya, Shyuichi (ed.) et al., Singularities in generic geometry. Proceedings of the 4th workshop on singularities in generic geometry and applications (Valencia IV), Kobe, Japan, June 3–6, 2015 and Kyoto, Japan, June 8–10, 2015. Tokyo: Mathematical Society of Japan (MSJ). Adv. Stud. Pure Math. 78, 221-249 (2018).

Let  $\hat{\omega}$  be the canonical symplectic structure of  $T\mathbb{R}^{2n}$  considered as the pull-back of the Liouville symplectic form of  $T^*\mathbb{R}^{2n}$ . Fix a submanifold of  $\mathbb{R}^{2n}$   $K$  and a smooth function  $h : K \rightarrow \mathbb{R}$ . A *generalized Hamiltonian system* is defined as a submanifold of  $T\mathbb{R}^{2n}$  over  $K$ , which is also a Lagrangian submanifold of  $(T\mathbb{R}^{2n}, \hat{\omega})$  with respect to  $h$ . The aim of this work is to study submanifolds  $K$  on which solvable generalized Hamiltonian systems may exist. The Section 2 deals with solvability on even-dimensional submanifolds while Section 3 concerns solvability over constant-rank constraints. A proper Morse function on the sphere  $S^2$  and an associated Hamiltonian vector field are studied in the last section.

For the entire collection see [\[Zbl 1407.58001\]](#).

Reviewer: [Mircea Crăsmăreanu \(Iași\)](#)

**MSC:**

- [53D05](#) Symplectic manifolds (general theory)
- [51N10](#) Affine analytic geometry
- [53D22](#) Canonical transformations in symplectic and contact geometry
- [70H05](#) Hamilton's equations
- [15A04](#) Linear transformations, semilinear transformations

**Keywords:**

[symplectic manifold](#); [Hamiltonian systems](#); [symplectic constraints](#)