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NONREGULAR CONTACT STRUCTURES ON BRIESKORN MANIFOLDS[1]

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1. **Introduction.** In 1958, Boothby and Wang [1] showed that if a compact, $(2n-1)$-dimensional differentiable manifold M^{2n-1} admits a regular contact structure, then M^{2n-1} is the total space of a principal S^1 bundle over a symplectic manifold. To the authors' knowledge no examples of nonregular contact structures on compact manifolds have appeared in the literature. The purpose of this announcement is to exhibit a large class of compact manifolds that admit a contact structure; this class of manifolds includes the Brieskorn and generalized Brieskorn manifolds, and, in particular, those exotic spheres that arise as Brieskorn manifolds. Furthermore, when $n = 2$, these contact structures are often nonregular.

In the next section we recall the relevant definitions, state our main theorems, and indicate their proofs. The details will appear elsewhere.

2. Let M^{2n-1} be a $(2n-1)$-dimensional differentiable manifold. A contact structure on M^{2n-1} is a 1-form ω that satisfies

$$\omega \wedge (d\omega)^{n-1} \neq 0 \quad \text{everywhere.} \tag{1}$$

A distribution V is associated with ω as follows. Let

$$V_p = \{X \in T_p(M^{2n-1}) \mid d\omega(X, Y) = 0 \ \forall \ Y \in T_p(M^{2n-1})\}.$$

Because of (1), $\dim V_p = 1$. Thus, V is integrable and determines a one-dimensional foliation of M^{2n-1}. The contact structure is called regular if this foliation is regular in the sense of foliations [6]; otherwise, it is called nonregular. Recall that a foliation is called regular if for each $p \in M^{2n-1}$ there exists Froebenius coordinates around p such that different slices belong to different leaves.

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