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GENERALIZED BRIESKORN MANIFOLDS

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Introduction. The manifolds defined by E. Brieskorn in [1] have been much studied and used in recent years. We present here the calculation of various invariants of these manifolds. Actually, we study a more general class, manifolds K defined as neighborhood boundaries of isolated singularities of complete intersections of Brieskorn varieties subject to the condition that K admits a natural type of S^1-action. This class contains the manifolds studied by H. Hamm [5] as a proper subset.

The results described here are from the author's University of Wisconsin Ph.D. thesis, written with the invaluable guidance of Professor Peter Orlik. Details, proofs, and further results will appear elsewhere.

DEFINITION. Let

$$f_i(z_1, z_2, \ldots, z_{n+m}) = \sum_{j=1}^{n+m} \alpha_{ij} z_j^{a_{ij}}, \qquad i = 1, 2, \cdots, m,$$

be a collection of complex polynomials. Let V_i be the variety in C^{n+m} associated with f_i and let $V = \bigcap_{i=1}^m V_i$. Let $d_i = \text{l.c.m.}(a_{i1}, \cdots, a_{i,n+m})$, $q_{ij} = d_i/a_{ij}$.

We suppose

(i) V is a complete intersection of the V_i.

(ii) V has an isolated singularity at the origin.

(iii) q_{ij} is independent of i (let $q_j = q_{ij}$).

Let $K = V \cap S^{2(n+m)-1} \subset C^{n+m}$. The C^*-action on V given by

$$t \circ (z_1, \cdots, z_{n+m}) = (t^{q_1} z_1, \cdots, t^{q_{n+m}} z_{n+m})$$

restricts to an action of S^1 on K. Let K^* be the orbit space, $K^* = K/S^1 = V - \{0\}/C^*$. K is called a *generalized Brieskorn manifold.*

In [5] Hamm considered similar objects. He required that the exponents a_{ij} be independent of i, a more restrictive condition than (iii) above. [4] shows that K is an $(n-2)$-connected $(2n-1)$-manifold which bounds a parallelizable manifold. Thus K is essentially classified (as a smooth

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