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Folded Toric Four-Manifolds. Preliminary report.

A folded symplectic form on a manifold is a two-form that is symplectic away from a hypersurface in the manifold and whose degeneracies are well-controlled on the hypersurface. When the hypersurface is empty, we arrive at a generalization of the notion of a symplectic manifold. If an n-torus acts effectively on a compact, connected 2n-manifold in a Hamiltonian fashion with respect to a folded symplectic form (i.e., if there is a moment map for the action), we say it is a folded toric manifold. Classifying folded toric manifolds is made difficult due to the lack of connectivity of fibers of the moment map. The intent of this report is to discuss the classification of folded toric four-manifolds and, in particular, to highlight the obstructions to extending locally isomorphic models to global ones in a unique way. (Received September 16, 2008)