1014-53-1241   **Ricardo Castano-Bernard*** (`rcastano@member.ams.org`), University of Leipzig, Fakultaet fuer Mathematik und Informatik, Mathematisches Institut, 04109 Leipzig, Germany, and **Diego Matessi** (`matessi@unipmn.it`), Universita degli Studi del Piamonte Orientale, Facolta di Scienze MNF, via Bellini 25/G, 15100 Alessandria, Italy. *Semi-global invariants of piece-wise smooth Lagrangian fibrations.*

We give a general method to construct S^1-symmetric Lagrangian n-torus fibrations of smooth symplectic manifolds given by piece-wise C^∞ maps. These fibrations may fail to be C^∞ along the slice $\mu^{-1}(0)$ of the moment map μ of the S^1-action. We develop a theory of action-angle coordinates which generalizes the classical theory to this piece-wise smooth setting and show that the fibrations studied give rise to new semi-global symplectic invariants. We discuss some applications of these results which may help for a better understanding of Lagrangian fibrations of Calabi-Yau manifolds. (Received September 27, 2005)

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