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Daniel F Cibotaru and **Liviu I Nicolaescu*** (lnicolae@nd.edu), Department of Mathematics, University of Notre Dame, Notre Dame, IN. *Riemann-Roch and Morse theory*.

We investigate the Dolbeault operator on a pair of pants, i.e., an elementary cobordism between a circle and the disjoint union of two circles. This operator induces a canonical selfadjoint Dirac operator D_t on each regular level set C_t of a fixed Morse function defining this cobordism. We show that as we approach the critical level set C_0 from above and from below these operators converge in the gap topology to (different) selfadjoint operators D_{\pm} that we describe explicitly. We also relate the Atiyah-Patodi-Singer index of the Dolbeault operator on the cobordism to the spectral flows of the operators D_t on the complement of C_0 and the Kashiwara-Wall index of a triplet of finite dimensional lagrangian spaces canonically determined by C_0 . (Received November 19, 2014)