THE MORSE-BOTT INEQUALITIES VIA DYNAMICAL SYSTEMS: ERRATUM CONCERNING THE ORIENTATION ASSUMPTIONS

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Correction

The statement of Theorem 8 (Morse-Bott inequalities) in the paper says, "...assume that all of the critical submanifolds of f are orientable." This should be corrected to, "...assume that all of the negative normal bundles of the critical submanifolds of f are orientable."

Discussion

If $f : M \to \mathbb{R}$ is a Morse-Bott function, then the tangent bundle of M along a critical submanifold $C \subseteq M$ splits as

$$T_*M = T_*C \oplus \nu_*^- C \oplus \nu_*^+ C$$

(see Lemma 5 of the paper), where $\nu_*^- C$ is the negative normal bundle of C. In the paper it is assumed that M is orientable in order to simplify the exposition. However, even if T_*M is orientable, the assumption that T_*C is orientable is different from the assumption that $\nu_*^- C$ is orientable, unless $\nu_*^+ C$ is orientable.

The corrected orientation assumption is needed in the proof of Lemma 9 of the paper. In the statement of that lemma, the phrase "C_j is orientable" should be corrected to "$\nu_*^- C_j$ is orientable".

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