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"Relative Framing of Transverse Knots".

A knot in a contact manifold (M, C) transverse to a trivialized contact structure has the natural framing given by the first of the trivialization vectors along the knot. If the Euler class $e_C \in H^2(M)$ of C is nonzero, then C is nontrivializable and the natural framing of transverse knots does not exist.

We construct a new framing-type invariant of transverse knots called relative framing. It is defined for all tight C and many other cases when the contact structure is not trivializable and the classical framing of transverse knots is not defined. We show that the relative framing distinguishes many transverse knots that are isotopic as unframed knots.

We show that the groups of Vassiliev-Goussarov invariants of transverse and of framed knots are canonically isomorphic, whenever the relative framing is well-defined.

As a useful tool, we show that $|e_C(\alpha_*([F^2]))| \leq \max\{0, -\chi(F^2)\}$ for a tight (M, C) and a continuous mapping $\alpha : F^2 \rightarrow M$ of a closed oriented F^2 . This generalizes the Eliashberg's Bennequin-type inequality for embeddings α . (Received October 01, 2005)