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Fixed point theory and framed cobordism. (English) Zbl 1047.54027

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A neighbourhood retract over X, or ENR_X, is a space over X, $p : E \to X$, such that there is an embedding $i : E \hookrightarrow \mathbb{R}^q \times X$ such that $\text{proj}_X \circ i = p$, an open neighbourhood U of $i(E)$ in $\mathbb{R}^q \times X$, and a retraction $r : U \to X$ such that $p \circ r = \text{proj}_{X|U}$. Let $p : E \to X$ be an ENR_X and let m, n be nonnegative integers. An m, n-commutative situation over X is a fiber-preserving map $f : \mathbb{R}^n \times E \supset V \to \mathbb{R}^n \times E$ which is properly fixed. The Thom-Pontryagin construction for fixed point situations is studied and a natural correspondence between framed cobordism classes and fixed point situations is given. The fixed point situations lead to a cohomology theory, called FIX^*; it generalizes to an equivariant theory for compact Lie groups. Applications to equivariant cobordism are discussed.

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MSC:

54H25 Fixed-point and coincidence theorems (topological aspects)
55N22 Bordism and cobordism theories and formal group laws in algebraic topology
55M20 Fixed points and coincidences in algebraic topology

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Cobordism; fixed point index; generalized cohomology

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