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Zhengyi Zhou* (zhengyizhou@berkeley.edu), Univ of Calif, Berkeley, Dept of Math Suite 3840, 951 Evans Hall, Berkeley, CA 94720-3840. *Quotient of polyfold and applications to equivariant transversality*. Preliminary report.

Hofer, Wysocki and Zehnder developed polyfold theory to regularize moduli spaces of pseudoholomorphic curves by transverse perturbations of a single section. We extend this theory to obtain equivariant regularizations of moduli spaces with a global compact group action, that is we construct an equivariant fundamental class(EFC). We moreover prove a localization theorem for the equivariant fundamental class for torus actions.

The main tool is a general quotient theorem for polyfold Fredholm sections that are equivariant under a free scale smooth action.

While equivariant transversality may fail – even in finite dimensional cases, when the action has nontrivial stabilizers – we can use our quotient construction to analyze the obstructions in the case of S^1 action. If these vanish, we construct an equivariant transverse perturbation, so that the equivariant fundamental class is represented by the quotient of its zero set as a S^1 space.

As an example of obstructions to equivariant transversality, we show the existence of a rigid curve of negative Fredholm index in a Hirzebruch surface with S^1 -action, even under S^1 -equivariant polyfold perturbations. We moreover use EFC to explain how this curve should contribute to equivariant Gromov-Witten theory. (Received September 21, 2015)