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Goo Ishikawa* (ishikawa@math.sci.hokudai.ac.jp), Dep. of Math., Hokkaido Univ., Kita 10 Nishi 8, Kitaku, Sapporo, 060-0810, Japan. *Openings of stable unfoldings.*

For a map-germ $f : \mathbf{K}^n \rightarrow \mathbf{K}^m$, ($n \leq m$, $\mathbf{K} = \mathbf{R}$ or \mathbf{C}), we introduce the notion of *openings* of f . An opening $F : \mathbf{K}^n \rightarrow \mathbf{K}^m \times \mathbf{K}^r$ of f , separates, via the projection $\pi_1 : \mathbf{K}^m \times \mathbf{K}^r \rightarrow \mathbf{K}^m$, the self-intersections of the original f , preserving the singularities of f . The notion of openings of f is different from the notion of unfoldings $\mathbf{K}^n \times \mathbf{K}^k \rightarrow \mathbf{K}^m \times \mathbf{K}^k$: Openings do not unfold the singularities. For example, the swallowtail is an opening of Whitney's cusp $\mathbf{K}^2 \rightarrow \mathbf{K}^2$ and the open swallowtail is a "versal" opening of them. Openings of map-germs appear as typical singularities in several problems of geometry and its applications. The notion of openings has close relation to isotropic map-germs in a symplectic space and integral map-germs in a contact space. We will describe the openings of Morin singularities, namely, stable unfoldings of map-germs of corank 1. Moreover we will show the method to construct versal openings of map-germs of corank ≥ 2 . (Received November 21, 2011)