STRATIFIED MORSE CRITICAL POINTS AND EULER OBSTRUCTION

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JOINT WORK WITH
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The Brasselet number of a function f with non-isolated singularities describes numerically the topological and geometrical informations of its generalized Milnor fiber. For instance, when $g : (X, 0) \to (\mathbb{C}, 0)$ is prepolar, Dutertre and Grulha Jr. proved [2] that the difference of the Brasselet numbers $\mathrm{B}_{f,X}(0)$ and $\mathrm{B}_{f,X^g}(0)$ is measured by the number of Morse critical points on the top stratum of the Milnor fiber of f appearing in a morsefication of g, where $X^g = X \cap g^{-1}(0)$. In this work, considering X a toric variety and using its combinatory, we prove that the difference of the Brasselet numbers $\mathrm{B}_{f,X}(0)$ and $\mathrm{B}_{f,X^g}(0)$ is related with the number of Morse critical points on the top stratum of the Milnor fiber of f appearing in a morsefication of g, even in the case where g has a d-dimensional critical locus, with arbitrary d. This work was motivated by the results obtained in [1].

References

[1] Dalbelo, T. M. and Hartmann, L.: *Brasselet number and Newton polygons*, Manuscripta Mathematica, 1–29 (2019).
[2] Dutertre, N. and Grulha Jr., N. G.: *Lê-Greuel type formula for the Euler obstruction and applications*, Adv. Math., 251, 127–146 (2014).

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