

The Herglotz principle for fields

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The Herglotz principle generalizes Hamilton's principle by allowing action dependent Lagrangians. It provides a variational formulation for contact Hamiltonian systems. These systems have found applications in the study of some thermodynamical and dissipative mechanical systems, among others. There are several attempts to generalize this theory to fields. One of those is geometric, the k -contact formalism [1]. Others are variational [2, 3].

In this presentation we will follow this second route. We will propose a Herglotz principle for fields. We will derive this principle in a more general geometric language and compare it to the existing approaches.

This presentation is based on joint work with J. Gaset, X. Gràcia and A. Mas

References

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- [2] B. Georgieva, R. Guenther, and T. Bodurov, “Generalized variational principle of Herglotz for several independent variables. First Noether-type theorem”, *Journal of Mathematical Physics* **44**, 3911–3927 (2003) [10.1063/1.1597419](https://doi.org/10.1063/1.1597419).
- [3] M. J. Lazo, J. Paiva, J. T. S. Amaral, and G. S. F. Frederico, “An Action Principle for Action-dependent Lagrangians: toward an Action Principle to non-conservative systems”, *Journal of Mathematical Physics* **59**, 032902 (2018) [10.1063/1.5019936](https://doi.org/10.1063/1.5019936).