

# On the local well-posedness of Horndeski theories

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In this talk, I will discuss some recent results on the local well-posedness of the initial value problem for Horndeski theories. Three different strongly hyperbolic modifications of the ADM formulation of the Einstein equations are extended to cubic Horndeski theories in the weak field regime. In the first one, the equations of motion are rewritten as a coupled elliptic-hyperbolic system of partial differential equations. The second one is based on the BSSN formulation with a generalised Bona-Massó slicing (covering the 1+log slicing) and non-dynamical shift vector. The third one is an extension of the CCZ4 formulation with a generalised Bona-Massó slicing (also covering the 1+log slicing) and a gamma driver shift condition. This final formulation may be particularly suitable for applications in non-linear numerical simulations.

I will also comment on more general Horndeski theories.

## References

- [1] Áron D. Kovács, Well-posedness of cubic Horndeski theories, *Forthcoming*, March 2019.
- [2] Áron D. Kovács, On the well-posedness of the most general Horndeski theories, *Forthcoming*, 2019.