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## Initial conditions and bulk viscosity effects on $\Lambda$ polarization in high-energy heavy ion collisions

The  $\Lambda$  polarization is a crucial probe of the gradients of velocity and temperature in the quark-gluon plasma generated in heavy-ion collisions. However, it is still not systematically used to tune hydrodynamic models. In this talk, we investigate the influence of different initial conditions and parametrization of the bulk viscosity on  $\Lambda$  polarization, showing that they affect the local polarization significantly. These results highlight the impact that the use of local  $\Lambda$  polarization can have on refining theoretical models. Finally, we compare our results, including feed-down corrections, with experimental data from high-energy heavy-ion collisions at STAR and ALICE, and demonstrate the crucial role of bulk viscosity in generating the correct sign of longitudinal polarization at LHC energies.

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### Category

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### Collaboration (if applicable)

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