

# Computing polarimeter vector fields with symbolic amplitude models

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Recently, the LHCb collaboration has computed the *aligned polarimeter vector field* for the dominant hadronic decay mode of the  $\Lambda_c$  baryon (arXiv:2301.07010). The polarimeter vector field is a model-independent representation of the decay rate for polarized decays that can be used to measure polarisation and to improve the sensitivity of amplitude models.

The computations were performed with a new approach using methods from the ComPWA project. Amplitude models are implemented symbolically with a Computer Algebra System, so that the mathematics can be easily inspected. The symbolic model then serves as a template for fast, numerical back-ends like JAX and TensorFlow. This *symbolic approach* makes it easy to formulate and fit amplitude models in a self-documenting workflow with high performance on large, multidimensional data samples. In addition, the approach proved flexible enough to compute these more complicated polarimeter vector fields.

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