

## First Measurement of the energy dependent $N^*$ production amplitude with a Partial Wave Analysis

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The production of hadrons with strange quarks within nuclear matter is fundamental to unravel the mystery about the content of neutron stars. A large fraction of strange hadrons are produced by resonances with broad masses that can undergo interference effects before they decay into strange hadrons.

We present here the first determination of the production amplitude of  $N^* \rightarrow p + \text{Kaon} + \text{Lambda}$  for resonances with masses between 1650 and 1900 MeV/c<sup>2</sup> and an excess energy up to 700 MeV via a partial wave analysis. The resonance amplitudes were extracted by analysing the reaction  $p + p \rightarrow p + \text{KLambda}$  measured in seven different data samples for fixed target experiments at kinetic energies between 1.9 and 4.3 GeV by the COSY-TOF, DISTO, FOPI and HADES collaborations. This work establishes a new paradigm in the understanding of strange hadrons production and opens up the precision era for the investigation of strangeness production in nucleon nucleon reactions.

### List of tracks

Hadron resonances

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