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Problem: Select a predictive model (small test error) in the case of small size data set and large number of variables.

ML tools: LASSO, Cross Validation and Infor. criteria

Applications: Hadron Physics, Analysis of reactions, recently, analysis of latticeQCD data.



Example: 46- parameter model. Phys. Rev. C95, 015203

Parametrization for $\gamma p \rightarrow \pi^0 p$

For \mathcal{M} the electric $E_{L\pm}$, and magnetic $M_{L\pm}$ multipoles,

$$\text{Re, Im } \mathcal{M}_{L\pm} = \frac{q_{\pi^0}^L}{m_{\pi^+}^{L+1}} \sum_{i=0}^{i_{\max}} \frac{a_i}{10^{-i}} \left(\frac{\omega_{\pi^0} - m_{\pi^0}}{m_{\pi^+}} \right)^i$$

