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The Mach3 Bayesian oscillation Analysis framework of the T2K experiment

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The Tokai-to-Kamioka (T2K) long-baseline neutrino experiment measures neutrino-flavor oscillation parameters using the three-flavor oscillation model parameterized by the PMNS matrix. This measurement is performed by sampling the JPARC (anti)neutrino beam by various detectors: once at a near detector complex before oscillations take place and once at a far detector after oscillations. A critical part of the data analysis is the fit machinery that needs to find the best compatibility of a large number of parameters (neutrino interaction, flux, detector, and oscillation model parameters) with the neutrino scattering data. T2K uses several approaches to fit the data that are frequently cross-checked against each other. In this talk, the Bayesian analysis approach is presented, which performs a joint near and far detector fit and uses a Markov Chain Monte Carlo sampling

Presenter: RADICS, Balint (York University)

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