New two detector results of the Double Chooz experiment

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In the last twenty years neutrino flavor oscillations were discovered in several experiments, implying that neutrinos are massive particles. The Double Chooz reactor antineutrino experiment, running since 2011 at the Chooz nuclear power plant in France, aims to measure the neutrino mixing angle θ13 with high precision. In the first years Double Chooz was studying this fundamental parameter with one detector only, searching for a disappearance of the electron antineutrinos emitted from the reactor. This detector is located 1.05 km from the two nuclear reactor cores near to the first oscillation maximum.

Since beginning of 2015 a second detector placed closer to the reactors is collecting data providing an un-oscillated reference measurement. In this multi-detector configuration, the so far dominant flux uncertainty becomes negligible. A precise measurement of θ13 provides a crucial input for upcoming projects sensitive to leptonic CP-violation and atmospheric mass hierarchy observables. New results of this year are presented including data with both detectors operating simultaneously. Beyond the oscillation analysis the near detector neutrino energy spectrum will be compared to flux predictions. In this way the anomalous reactor neutrino flux and spectral distortion will be investigated, as observed in different experiments within the last years.