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# The Double Chooz Detectors Design

Multi-detector liquid-scintillator reactor anti-ν experiments can play an important role on the high precision era of neutrino oscillations parameters. Multi-detector experiments rely on the relative response comparison across detectors. Therefore, they need to face a novel concept of detector design and calibration. Detectors are to be designed such that they are easily calibrated to reach unprecedented inter-detector calibration precision: < 0.6%. To this aim, the Double Chooz collaboration has conceived a multi-volume (4 volumes) detectors plus an outer veto. This concept minimises the impact of systematic uncertainties of both relative detectors responses and analysis cuts, while granting the largest background reduction possible. Each detector is endowed with the latest technology such as very fast FADC (codeveloped with CAEN) to control detector systematic like relative deadtime and backgrounds (different in each detector) identification. Such a design has strongly inspired all other collaborations aiming to reach the same compelling physics. The statics power necessary demands that metal loaded liquid scintillator must be stable over 5 years running. Scintillator stability has been a limiting factor in previous similar experiments. Double Chooz R&D programme (5 years long now) has achieved a stable formulation of scintillator with the necessary properties. I would aim to highlight the Double Chooz R&D programme emphasising our strategies for the detector systematics and inter-detector calibration novelties.

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