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Xenoscope – a full-scale vertical demonstrator for the DARWIN observatory

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The DARWIN observatory is a proposed multi-purpose experiment for dark matter and neutrino physics. At its heart, DARWIN will feature a 50 tonne (40 tonnes active) dual-phase xenon Time Projection Chamber (TPC) allowing to probe the experimentally accessible parameter space for Weakly Interacting Massive Particles (WIMPs) in a wide mass-range until neutrino interactions with the target become an irreducible background. To test key technological concepts required for the realization of DARWIN, we built Xenoscope at the University of Zürich, a full-scale vertical demonstrator using 350 kg of liquid xenon (LXe). Xenoscope will be used to demonstrate, for the first time, the drift of electrons in LXe over 2.6 m. The facility will also be used to study electron cloud diffusion and to measure optical properties of liquid xenon. In the future, Xenoscope will be available as a platform to test multiple subsystems of DARWIN. This talk will present an overview of the DARWIN experiment and of the Xenoscope facility and its commissioning, as well as current measurements of the purity of liquid xenon and future measurements campaigns.

Primary experiment

Author: GIRARD, Frédéric (University of Zürich)

Co-authors: MANFREDINI, Alessandro (University of Zurich); THIEME, Kevin (University of Zurich); BAUDIS, Laura (University of Zurich); GALLOWAY, Michelle (University of Zürich); MCFADDEN, Neil; SANCHEZ-LUCAS, Patricia (University of Zurich); PERES, Ricardo (University of Zurich); BIONDI, Yanina (University of Zurich)

Presenter: GIRARD, Frédéric (University of Zürich)

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