

Test benches and test beams play a major role in today's sensor R&D: E.g. probe stations are used for C-V or I-V measurements which allow for basic tests and the derivation of material parameters. The more powerful transient current technique is used to extract quantities like the transit time and lifetime of free charges carriers in semiconductors, and electric field distributions. Thermally stimulated currents are used to extract trap activation energies and trap densities, e.g. for irradiated sensors. More sophisticated measurements are undertaken making use of high-energetic charged particles of various types. The trajectory of such a particle is tracked using so-called beam telescopes, which usually consist of multiply planes, where the track of the particle is measured. A device-under-test is placed between or behind the planes and the trajectory is extrapolated to this device. With the information of the position of the particle incident at hand, detailed sensor studies can be performed. But not only the sensor itself can be tested. When a hybrid structure is placed in the beam, the response of the hybrid can be analysed and conclusions about the read-out-chip can be drawn. In an even bigger picture, an entire DAQ system can be tested under almost real conditions during its development.

The talk gives an overview of a selection of various test benches and test beams.