

# Low Level RF Workshop 2022



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## Low Level RF System of the LIGHT Proton Therapy Linac

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The LIGHT (Linac for Image-Guided Hadron Therapy) linac is designed to produce proton beams up to 230 MeV for cancer therapy. The machine consists of three different kinds of accelerators: RFQ (Radio-Frequency Quadrupole), SCDTL (Side Coupled Drift Tube Linac) and CCL (Coupled Cavity Linac). These accelerating structures operate with RF power at 750 MHz (RFQ) and 3 GHz (SCDTL, CCL) which is generated from the Low-Level RF (LLRF) system and is amplified in the high RF power feeding stations. The LLRF system is not only responsible of sourcing RF with high amplitude and phase stability, but also of monitoring the RF signals coming from the RF network and the accelerating structures. In addition, the LIGHT LLRF is commissioned to shape RF pulses, apply feedback corrections to keep amplitude and phase stability, RF breakdown detection and resonance frequency feedback. These functionalities operate on a pulse-to-pulse basis and their control is integrated in a Front-End Controller (FEC) which connects it to the main LIGHT control system. In this contribution we exhibit the main features of the AVO LLRF system, its operation and performance.

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