

# Bunch-by-bunch feedback system used as a diagnostic device for multi-bunch instabilities in the DAΦNE collider

*Wednesday, March 19, 2025 4:10 PM (25 minutes)*

DAΦNE is an electron-positron collider operating at INFN-LNF. Bunch-by-bunch feedback systems installed in each of the two rings allow to store high-intensity and stable beams, by counteracting strong coupled-bunch instabilities due to e-cloud and RF higher-order modes. These feedback systems can be also used as a diagnostic tool which is able to measure beam parameters which are important for the evaluation of the instabilities. In this talk, we first describe the acquisition system used to record the beam data obtained with the feedback systems. Then we report transverse-tune shift and grow-damp measurements performed in 2024 with positron beams, by using the feedback as a diagnostic device. These measurements contributed to the characterization of the e-cloud beam instability, which currently is one of the main limitations for the DAΦNE performances. Finally, we describe the first beam measurements and feedback-system setup designed to automatically record turn-by-turn bunch position displacements when an unexpected loss in beam current occurs due to any faults in the collider. This tool can be useful in identifying the causes of these events.

**Author:** QUARTULLO, Danilo (INFN-LNF)

**Presenter:** QUARTULLO, Danilo (INFN-LNF)

**Session Classification:** Challenging issues: part 1