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A Python-based LLRF Algorithm Library

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Many common algorithms are used in LLRF applications or testing software. Implementing these algorithms as a library with widely used computer languages is attractive to share knowledge within the LLRF community and avoid duplications in development. This poster reports the progress of implementing an LLRF algorithm library in Python, a popular language used in LLRF high-level applications and beam controls. The following algorithms are implemented: cavity parameters and model identification, RF system calibration, RF signal demodulation, RF controller design and analysis, noise analysis, and RF system simulation. The library is in the form of general routines with interfaces adaptable to different data formats and accelerator machines. The routines can be directly used in Python-based software, such as the Python-EPICS-based soft IOC automating the operation of an RF station. We also demonstrate the library with data from actual or simulated RF systems.

Keyword

Python, Algorithm Library

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