



Contribution ID: 6

Type: poster

## RF System Modeling and Simulation for the SOLEIL Synchrotron

*Tuesday, 11 October 2005 09:56 (3 minutes)*

An analysis of beam stability in the SOLEIL synchrotron with two different basic systems (direct and amplitude/phase feedback) was carried out during the preliminary design phase in 1999. Since then, on the one hand, the beam energy was pushed from 2.5 GeV to 2.75 GeV, which led to a change of several other machine parameters such as the harmonic number, accelerating voltage, relative beam loading factor and external coupling factor; on the other hand, an analog LLRF system combining one fast direct feedback and one slow amplitude/phase feedback was approved for the machine commissioning. Therefore, a new simulation for the optimization of the LLRF system parameters appeared necessary. It additionally takes into account different features (loop delays, bandwidth limitation, extra power budget, possible implementation of a comb-filter, etc.), which were ignored in the preliminary analysis. A comparison with a fast digital I/Q LLRF system, currently under development, is also presented with a Matlab and Simulink based simulation tool, which is more versatile than the formerly used Fortran based code.

**Primary authors:** Mr DIOP, Massamba (Synchrotron SOLEIL); Mr LUONG, Michel (CEA Saclay)

**Co-authors:** Mr RIBEIRO, Fernand (Synchrotron SOLEIL); Mr PIQUET, Olivier (CEA Saclay); Mr MARCHAND, Patrick (Synchrotron SOLEIL); Mr SREEDHARAN, Rajesh (Synchrotron SOLEIL)

**Presenters:** Mr DIOP, Massamba (Synchrotron SOLEIL); Mr LUONG, Michel (CEA Saclay)

**Session Classification:** Poster Session with Author Participation