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Four Harmonic Buncher For FSU LINAC DANIEL MOERLAND, INGO WIEDENHÖVER, Florida State University — Florida State University's John D. Fox Superconducting Accelerator Laboratory is operating a Tandem-Linac system for heavy ion beams at energies of 5-10 MeV/u. Recently, the accelerator has been used as the driver for the radioactive beam facility RESOLUT, which poses new demands on its high-intensity performance and time-resolution. These demands motivated us to optimize the RF bunching system and to switch the bunch frequency from 48.5 to 12.125MHz. We installed a four-harmonic resonant transformer to create 3-4 kV potential oscillations across a pair of wire-mesh grids. This setup is modulating the energy of the beam injected into the tandem accelerator, with the aim to create short bunches of beam particles. A sawtooth-like wave-form is created using the Fourier series method, by combining the basis sinusoidal wave of 12.125MHz and its 3 higher order harmonics, in a manner similar to the systems used at ATLAS and other RF-accelerators. A new aspect of our setup is the use of a digital 1GHz function generator, which allows us to optimize and stabilize the synthesized waveform. The control system was realized using LabView and integrated into the controls of the accelerator.

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