LISA Injector Optimization by Stripline Signal Spectral Analysis, M. CASTELLANO, M. FERRARIO, M. MINESTRINI, P. PATTERI, F. TAZZIOLI, INFN-LNF, L. CATANI, S. TAZZARI, INFN-TOV, G. CAVALLARI, CERN - In the LISA Injector a thermionic Gun provides a 100 keV beam several msec long at 1 Hz repetition rate which is transformed in a train of bunches 10 ps long of 2 mA average current with 50 MHz repetition rate by a 50+500 MHz Chopping system and a 500 MHz Pre-Buncher. Then a β-graded 2.5 GHz Capture Section drives the beam up to 1.1 MeV. The performances of the Injector have been checked by means of a quasi-on-line analysis of the line spectra of Striplines signals. Preliminary measurements showed a dominant line in the spectrum at 2.5 GHz, indicating a too long bunch entering the Capture Section. A careful tuning of the Injector parameters has then been done looking at the line spectra behaviour. Beam spectra computations and measurement are illustrated.