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A Ka-Band accelerating structure as a linearizer for the Compact Light XLS project

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There is a strong demand for accelerating structures able to achieve higher gradient and more compact dimensions for the next generation of linear accelerators for research, industrial and medical applications. A future European light source, called Compact Light, operating in X band, has been proposed to extend FEL operation into the X-ray region further than other competing light sources. In this project a Ka-Band normal conducting high gradient RF accelerating structure is foreseen for linearizing the bunch phase space in order to compensate the non-linear distortions introduced by the RF curvature of the main accelerating cavities. In this talk we discuss the RF design of a 35.982 GHz linearizer, operating at third harmonic of the Linac frequency of 11.994 GHz, optimized to work at 100-125 MV/m accelerating gradient with an extremely low probability of RF breakdown and by using a high RF power of the order of 10 - 12 MW. In addition, preliminary estimations of the wakefields effects are presented.

Presenter: SPATARO, Bruno (INFN/LNF)

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