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Basics of RF Electronics II

Thursday 22 June 2023 11:00 (1 hour)

The focus of this educational text is selected examples of high-frequency electronic circuits and their components employed for the accurate phasing and synchronisation of accelerator cavities. Examples have been chosen to describe the basics of RF electronics. The starting point is transmission lines, connectors, discontinuities and the handling of reflection. The application of simple surface mount components is discussed. The first example presented is a circuit designed to synchronise the CLIC crab cavities. This example employs a co-planar waveguide, SMA connectors, Wilkinson splitters, and surface-mount double-balanced mixers. For the control of cavity phase and amplitude, the benefit of I&Q controllers will be explained. The text will then discuss the operation and use of a few more important components including I&Q modulators, ADCs, VCOs and optical fibre intensity modulators.

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