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Overview cavities II

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RF cavities are not only used to accelerate particle beams but they also kick beams or manipulate particles in the longitudinal phase space. They are used in linear and circular machines, some must have adjustable frequencies and some even accommodate multiple harmonics. Their operational use stretches from sub-permil duty cycles to continuous operation, they provide accelerating gradients from a few kilo Volts up to 100 million volts per metre using frequencies from a few Million Hertz up to 10s of Gigahertz. Depending on the specific use case their design and the used materials may be very different but they can all be classified using a well-established set of RF cavity characteristics. This lecture will derive these basic quantities from Maxwell's equations and give examples of various cavity types. Furthermore, the description of an RF cavity via lumped circuit parameters will be introduced.

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