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Construction of the RF System for the European XFEL

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The European XFEL is based on a superconducting linear accelerator with an energy of 17.5GeV. The nine-cell superconducting cavities are operated at 1.3GHz at a nominal gradient of 23.6MV/m. In order to supply RF power to the 808 superconducting cavities and to the normal conducting RF gun 27 RF stations are required. Each RF station generates up to 10MW of RF power at a pulse duration up to 1.4ms and a repetition rate of 10Hz. It consists of several subsystems and components e.g. klystrons, modulators or waveguides. A reliable, compact and inexpensive RF power distribution has been developed. During production of the cavities and the accelerating modules for the XFEL it turned out that cavities are only capable of different maximum gradients. Since the original layout was aimed for equal power of 120kW for each cavity it was necessary to modify the distribution allowing for individual RF power supply for each cavity, between 50kW and 240kW. This paper describes the final layout of the RF power distributions and reports on the present status of the construction of the RF system.

Summary

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