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Bimodal design of 500 MHz and 1.5 GHz normal conducting RF cavity for advanced synchrotron radiation facilities

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The advanced storage ring light source needs to realize ultra-low emittance beam operation, and improving the Touschek lifetime puts forward higher requirements for the performance of RF cavity. In this paper, a novel bimodal normal conducting RF cavity is proposed. In one cavity, two power sources will be connected at the same time to realize the simultaneous operation of the two frequencies. The TM₀₁₀ mode with the frequency of 500MHz is used for acceleration, and the TM₀₂₀ mode with the frequency of 1.5GHz is used as the third harmonic to improve the height of the RF bucket and achieve the purpose of lengthening the beam bunch. Two couplers are designed to adapt to the working characteristics of bimodal RF cavity.

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Footnotes

Bimodal RF cavity, bunch lengthening. synchrotron radiation

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Yes

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