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Design of 500 MHz HOM-damped normal conducting RF cavity

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Jinhua Light Source, which is an industrial light source, will be built in Jinhua City, Zhejiang Province, China. Its energy is 2.6 GeV and beam current is 500 mA. 4 sets of normal-conducting RF systems are likely to be chosen. A kind of 500 MHz HOM-damped normal conducting RF cavity has been designed for the Jinhua Light Source. The KEK-PF main cavity type was selected and three rectangular waveguides equally spaced by 120° . One of the rectangular waveguides is longitudinally separated from the other two rectangular waveguides. The main mode is TM₀₁₀ mode and the effective shunt impedance is greater than $7.5 \text{ M}\Omega$. The simulation results show that longitudinal HOM impedance is no more than $1 \text{ k}\Omega$ and transverse HOM impedance is no more than $50 \text{ k}\Omega/\text{m}$.

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