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## The circular electron-positron collider beam energy measurement with microwave-beam Compton backscattering

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The uncertainty of energy measurement of the circular electron-positron collider beam is required to be less than 10MeV for accurate measurement the Higgs/W/Z bosons' mass. It's proposed a new scheme of microwave-beam Compton backscattering to measure the beam energy by detecting the maximum energy of scattered photons. Choosing the  $TM_{010}$  mode of the standing wave cavity, the Poynting vector exists in the radial direction and the length of the cavity does not affect the resonant frequency. When the resonator cavity is placed vertically in the beam tube, the electron beam collides head to head with microwave photons as it passes through the cavity. After this process, the scattered photons emit from vacuum tube of the synchrotron radiation. To minimize the background noise from the synchrotron radiation, a combination of polyethylene and lead are used to shield synchrotron radiation photons. At the same time, the computer simulation technology(CST) software is used to simulate the frequency and field changes due to the holes for the electron beam penetration in the cavity. The measurement uncertainty of the beam energy can reach the order of 6MeV.

### Time Zone

Asia/Pacific

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