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The status of the energy calibration, polarization and monochromatization of the FCC-ee

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The Future Circular electron-positron Collider, FCC- ee, is designed for unprecedented precision for particle physics experiments from the Z-pole up to above the top-pair-threshold, corresponding to a beam energy range from 45.6 to 182.5 GeV. Performing collisions at various particle-physics resonances requires precise knowledge of the centre-of-mass energy (ECM) and collision boosts at all four interaction points. Measurement of the ECM by resonant depolarization of transversely polarized pilot bunches in combination with a 3D polarimeter, aims to achieve a systematic uncertainty of 4 and 100 keV for the Z-pole and W-pair-threshold energies respectively. The ECM itself depends on the RF-cavity locations, beamstrahlung, longitudinal impedance, the Earth's tides, opposite sign dispersion and possible collision offsets. Application of monochromatization schemes are envisaged at certain beam energies to reduce the energy spread. The latest results of studies of the energy calibration, polarization and monochromatization are reported here.

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Footnotes

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