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Reconstruction of the W mass and width at and above WW threshold at FCC-ee

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In the Standard Model theory, the mass of the W boson is predicted with an uncertainty of 4 MeV whereas the current experimental accuracy is of 12 MeV. Improving the accuracy of the W mass measurement is a crucial test of the overall consistency of the SM and any deviation might reveal the emergence of new physics. With more than 2×10^8 W pairs produced at the W threshold energy and above, the FCC-ee collider will be a W boson factory allowing for W mass measurement with unparalleled precision. With enough statistics in lepton collisions, the W mass can be directly measured at and above the threshold from the kinematic reconstruction of the W -pair decay products. In addition, e^+e^- collisions offer the possibility to derive the W mass from the WW cross-section measured at the pair-production threshold. The precise measurement of the W mass and width, with both methods, is presented in the context of a future experiment at FCC-ee. A statistical uncertainty on the W mass below 1 MeV is expected and the experimental and theoretical systematic uncertainties must be reduced to match such a level of precision.

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