The effects of $O(\alpha^2)$ initial state QED corrections to $e^+e^-\rightarrow\gamma^*/Z^*$ at very high luminosity colliders.

Tuesday, 04 February, 2020, DESY Auditorium, 16:45 h

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We present the recently completed $O(\alpha^2)$ initial state corrections to the process $e^+e^-\rightarrow\gamma^*/Z^*$, which is a central process at past and future high energy and high luminosity colliders for precision measurements of the properties of the Z-boson, the Higgs boson, and the top quark. We observe differences to an earlier result in the non-logarithmic contributions at $O(\alpha^2)$.

The new result leads to a 4 MeV shift in the Z width considering the lower end $s_0 = 4 m^2\tau$ of the radiation region, which is larger than the present accuracy. We present predictions on the radiative corrections to the central processes $e^+e^-\rightarrow\gamma^*/Z^*$, $e^+e^-\rightarrow Z H$ and $e^+e^-\rightarrow t\bar{t}$ planned at future colliders like the ILC, CLIC, Fcc-ee and CEPC to measure the mass and the width of the Z boson, the Higgs boson and the top quark, for which the present corrections are significant.

- Coffee, tea and cookies will be served at 16:30h

- After the colloquium there is a chance for private discussions with the speaker over drinks and pretzels