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## Beam dynamics and tolerance studies of the THz-driven electron linac for the AXSIS experiment

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A dielectric-loaded linac powered by THz-pulses is one of the key parts of the “Attosecond X-ray Science: Imaging and Spectroscopy” (AXSIS) experiment at DESY, Hamburg. Like in conventional accelerators the AXSIS linac is designed to have the phase velocity equal to the speed of light and in this case it is realized by tuning of the dielectric layer width and the radius of the vacuum channel. Therefore, structure fabrication errors will lead to a change in the beam dynamics and beam quality. Additionally, errors in the bunch injection will also affect the acceleration process and can cause a beam loss on the linac wall. This paper numerically investigates the process of the electron beam acceleration in the AXSIS linac taking into account the aforementioned errors. Particle tracking simulations were done using the ECHO code which uses low-dispersive algorithm for field calculation and was especially adopted for the dielectric-loaded accelerating structures.

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