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## Wakefield electron acceleration in guiding structures under real 3-D nonsymmetrical conditions

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The nonlinear structures of wakefields excited by the laser and ion bunch drivers are analyzed. The effect of noncollinear electron bunch injection into the wakefields is examined and conditions for an effective trapping of electrons are found.

The effect of non-symmetric focusing of the laser radiation into a capillary waveguide and plasma channel on the structure of wakefields and on the effectiveness of the electron bunch acceleration is studied. The restrictions on the maximum adoptable asymmetry for an effective acceleration of electron bunches are found and discussed for different phases and energies of the electron bunch injection depending on the asymmetry of radial laser intensity distributions and displacements of the laser focusing point relatively waveguide axis. Obtained results are in agreement with previous studies [1 - 3].

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### References

- [1] M. Veysman, N.E. Andreev, G. Maynard, B. Cros, Physical Review E 86 (2012) 066411.
- [2] N.E. Andreev, V.E. Baranov, B. Cros, G. Maynard, P. Mora, M.E. Veysman, Journal of Plasma Physics 79 (2013) 143.
- [3] N.E. Andreev, S.V. Kuznetsov, M.E. Veysman, Nuclear Instruments and Methods in Physics Research A 740 (2014) 273.

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