Potential Applications of Flying Mirrors for High-Field Science

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A relativistic flying mirror is a moving mirror that can reflect an incoming laser into a shorter-wavelength, shorter-pulse duration laser pulse due to the double Doppler effect, enabling the intensification of the laser [1]. Such a mirror is formed in underdense plasma as an electron density spike or cusp as a breaking plasma wave. The speed of the mirror is equal to the group velocity of the incoming laser in the plasma, thus with the use of underdense plasma, the speed of the mirror is in a relativistic regime.

Several proof-of-principle experiments have been made [2-4], and new insights are being developed [5]. We show a brief review of the flying mirror technology and potential applications, including the intensification of a laser with existing facilities [6].

References

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