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Stability of Ultrathin Solid Targets in the Radiation Pressure Dominated Regime with Circular Polarization C. BELLEI, R.G. EVANS, Imperial College London, S. ATZENI, La Sapienza, Rome, A.P.L. ROBINSON, Rutherford Appleton Laboratory, S. KAR, M. ZEPF, Queens University of Belfast
— The stability of ultrathin (thickness << laser wavelength) solid targets illuminated by circularly polarized laser pulses is studied in a regime where the radiation pressure is the dominant acceleration mechanism, by means of 2D3V PIC simulations (Osiris code). The Osiris simulations show that the foil exhibits an instability very similar to the classical Rayleigh-Taylor instability even though the foil material is not collisional. Indeed, it is found that the mechanism of ion bunch formation leads to the growth of unstable modes that become nonlinear in a few laser cycles and have a detrimental effect for the production of monoenergetic ions. The possibility of tailoring the laser intensity profile in order to inhibit the bunch formation and therefore decrease the growth of the instability will be also discussed.

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