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Non-Maxwellian effects in underdense plasmas heated by non-uniform laser beams JEAN-PIERRE MATTE, INRS-EMT — The collisionl heating of plasmas by intense laser beams is known to drive the electron distribution function into a super-Gaussian [1] or "DLM" [2] shape. This reduces the absorption [1], and the reduction is stronger if the beam is very non-uniform, for a given average intensity, as there is a depletion of slow electrons, compared to a Maxwellian of the same density and average energy. If the beam irradiates most or a good fraction of the plasma volume, these non-Maxwellian effects also imply a depletion of high energy electrons, with the resulting strong reduction of Landau damping of Langmuir waves [2], contrary to the results of Brunner and Valeo [3] which were obtained in the limit of a narrow beam heating a wide plasma. The depletion of fast electrons depends essentially on the average laser intensity. We will show how these two aspects vary with the laser and plasma parameters.

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