CHARACTERISTIC X RAYS RESULTING FROM THE VACUUM HEATING OF ELECTRONS

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A narrow-band picosecond pulse of Kα X-rays is the promising tool for probing dense plasmas [1], but the conversion efficiency of laser energy comes short of the values achieved for the He-α and Ly-α [2]. Several mechanisms of hot electron generation, essential in different ranges of laser pulse and target parameters, are known [3].

It is shown that K-α yield when a massive target is irradiated by femtosecond laser pulses of IHED facility [4] in a definite range of parameters is described by the model of vacuum (Brunel) heating of electrons [5]. Within the framework of this model, the number of K-α photons increases considerably when a target with a clustered surface is used due to driving electric field enhancement at a cluster surface and more favorable conditions for K-α photons escaping the wafer.

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