

Soft X-ray Production by Means of an Electron Beam, G. HAOUAT, C. COUILLAUD, S. STRIBY, CEA-BIII/SPTN, Bruyères-le-Châtel - We consider the possibility of producing soft X-ray pulses as short as 10 to 20 ps in the energy range 0.5 to 2 keV by means of the ELSA electron linear accelerator. The linac delivers a pulsed beam of 100 to 300 A peak intensity and 18 MeV energy. The mechanism of photon production considered here is the transition radiation resulting from the interaction of electrons with a stack of thin foils separated by vacuum. An optimized X-ray production, with 18 MeV electrons, implies a foil spacing of the order of a few μm , which is difficult to achieve with a stack of foils. The feasibility of experiments using a multilayer of two materials of different permittivities is investigated in order to get interference phenomena and to enhance the radiation production. Numerical computations are presented with an Al-C target, and compared to a stack of 1.5 μm thick mylar foils with 1 mm spacing. An experiment using both the stack of mylar foils and a multilayer target is also described here, and first experimental results are presented.