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**Superintense ion beam with high energy density** VADIM DUDNIKOV, USPTO, GALINA DUDNIKOVA, UMD CP — The energy density of ion beam accumulated in a storage ring can be increased dramatically with using of space charge compensation as was demonstrated in experiments [1]. The intensity of said superintense beam can be far greater than a space charge limit without space charge compensation. The model of secondary plasma build up with secondary ion-electron emission as a source of delayed electrons has been presented and discussed. This model can be used for explanation of bunched beam instability with electron surviving after gap, for prediction of e-cloud generation in coasting and long bunches beam, and can be important for pressure rise in worm and cold sections of storage rings. A fast desorption by ion of physically adsorbed molecules can explain a “first pulse Instability”. Application of this model for e-p instability selfstabilization and superintense circulating beam accumulation is considered. Importance of secondary plasma for high perveance ion beam stabilization in ion implantation will be considered. Preliminary results of simulation of electron and ion accumulation will be presented. [1]. Belchenko et al., Xth International Particle Accelerator Conference, Protvino, 1977, Vol. 2, p. 287.

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