Abstract Submitted
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Visco-elastic model of the "fuzz" growth[1] SERGEI KRASHENINNIKOV, UCSD — Recent experiments on the irradiation of Tungsten with helium-hydrogen plasma [1] have shown the formation of "fuzz," filled with nano-bubbles, on the front surface of the sample. We present theoretical model describing "fuzz" growth. This model is based on plastic deformation of the "skin" of the "fuzz" fibers caused by newly growing nano-bubble on the tip of the fiber. Newly glowing bubble having high helium pressure inside creates an excessive force on surrounding tungsten "skin" of the fiber and forming pressure difference between base and nose of the fiber. As a result, tungsten "flows" through the "skin" from the base to the nose. This model predicts all main features observed in experiments: t to 1/2 growth of length of the fibers, strong temperature dependence of the growth rate, and the saturation of the growth with ion helium flux to the substrate.

[1] S. Takamura, et al., Plasma Fusion Res., 1, 051 (2006); M. J. Baldwin, and R. P. Doerner, Nucl. Fusion 48, 035001 (2008); R. S. Kajita et al., Nucl. Fusion 49, 095005 (2009)

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Sergei Krasheninnikov
UCSD

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