Accepted Manuscript

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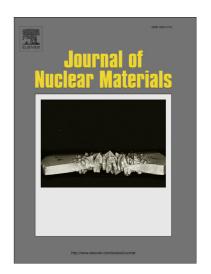
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PII: S0022-3115(14)00717-X

DOI: http://dx.doi.org/10.1016/j.jnucmat.2014.10.033

Reference: NUMA 48530

To appear in: Journal of Nuclear Materials



Please cite this article as: R.D. Smirnov, S.I. Krasheninnikov, J. Guterl, Atomistic modeling of growth and coalescence of helium nano-bubbles in tungsten, *Journal of Nuclear Materials* (2014), doi: http://dx.doi.org/10.1016/j.jnucmat.2014.10.033

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Atomistic modeling of growth and coalescence of helium nano-bubbles in

tungsten

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Abstract

The mechanisms of growth and coalescence of helium nano-bubbles in tungsten are

investigated using molecular dynamics simulations. It is shown that crystal symmetries and

governed by them properties of dislocations, generated by the growing nano-bubbles, are

responsible for main nano-bubble features revealed, including non-spherical shape and

anisotropy of surrounding stress field. The transport of helium atoms in non-uniform stress

field is simulated at different temperatures and the transport coefficients are determined. The

implications of the considered dislocation and helium dynamics on nucleation and growth of

bubbles in tungsten with implanted helium are discussed.

PACS: 52.40.Hf, 61.72.Qq, 66.30.Pa, 83.10.Rs

PSI-21 Keywords: Tungsten, Helium, Bubble, Molecular dynamics

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1

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