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**Effect of fission rate on the intergranular gas bubble swelling – A  
phase-field study**

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**ABSTRACT**

Recent experiments showed that with high fission rate irradiation the swelling rate of dispersion U-Mo fuel increases, although it is still not clear whether it comes from the interaction layer formation or accelerated fuel swelling. To explain the recent experimental observations, it is therefore essential to be able to predict the fission gas bubble behaviors under high fission rate conditions. Therefore, we apply the phase-field model to study the effect of fission rate on gas bubble swelling. Results show that the fission rate can have a large impact on gas bubble swelling but a small effect on recrystallization. The increased fuel swelling under high fission rate conditions mainly comes from the fast nucleation of gas bubbles and enhanced diffusion of Xe gas atoms under irradiation. The effects of resolution rate, enhanced grain boundary diffusivity of Xe, and grain size on gas bubble swelling are discussed.