

Abstract Submitted
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Effect of sub-T_g annealing on CuZr and AlSm glasses: A molecular dynamics study¹ YANG SUN, FENG ZHANG, YUE ZHANG, ZHUO YE, MIKHAIL MENDELEV, CAI-ZHUANG WANG, KAI-MING HO, Ames Laboratory, US DOE — Cu₆₅Zr₃₅ and Al₉₀Sm₁₀ glasses, which represent strong and marginal binary metallic glass formers, respectively, were developed with a sub-T_g annealing method [1–3] using Molecular Dynamics simulations. The short-range order (SRO) in both systems was characterized based on the concept of “crystal gene” that we established recently [4]. Furthermore, we found that while the local clusters representing the dominant short-range order form an ever-more pronounced interpenetrating network with slower cooling rates in Cu₆₅Zr₃₅ glasses, the interpenetration of SRO in Al₉₀Sm₁₀ glasses only shows a weak dependence on the cooling rate. This clear difference in the connectivity of the SRO, which can characterize the medium-range order (MRO), could contribute to the different glass forming abilities of both systems. [1] F. Zhang et al., Appl. Phys. Lett. 104, 61905 (2014). [2] Y. Zhang et al., Phys. Rev. B 91, 64105 (2015). [3] Y. Sun et al., J. Appl. Phys. 120, 15901 (2016). [4] Y. Sun et al., Sci. Rep. 6, 23734 (2016).

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Yang Sun
Ames Laboratory, US DOE

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