

Polydisperse sphere packings as model for multicomponent bulk metallic glasses

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Monodisperse and polydisperse sphere packings are an well established model to simulate the nanoscale and microscale structural properties of bulk metallic glasses. One of the most important parameter is the process of densification and structural change during cooling. Structural changes may appear as crystallization, melting, clustering and quasicrystalline behaviour. While multicomponent bulk metallic glasses are represented here by random dense packings with discrete polydisperse radii distribution, the process of densification during packing is investigated.

To generate dense packings of discrete multidisperse spheres the force-biased-algorithm as described in [1] and [2] is used. A simulation software suite with GUI allows the user not only to generate such packings with wide tunable parameters but offers the possibility to analyze them regarding stochastical and geometrical properties. This contribution shows how multicomponent bulk metallic glasses are optimized using a simulation suite based on models like random dense hard sphere packing.

#### References

- [1] W. S. Jodrey, E. M. Tory, Phys. Rev. A 32 (1985) 2347.
- [2] A. Bezrukov, M. Bargiel, D. Stoyan, Part. Part. Syst. Charact. 19 (2002) 111.