

Chocolate effect on the cracking in Bekko-Ame

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<http://www.eri.u-tokyo.ac.jp/kurikuri/Kitchen/BekkoAmeMain.html>

Bekko-ame is a Japanese traditional sweet. It is well known that there happen extensive crackings during the cooling stage from liquid state. Spatial evolution of the locations and the temporal evolution of cracking are sometimes referred as an analog of earthquake generation process. Visual observation and audible cracking sounds offer good opportunity to sense how earthquake happens and the fault grows in the class room. Progressive development of the cracked region shows a good example to understand how the overlapping of earthquakes is controlled along the fault. When we insert a piece of chocolate in the Bekko-ame at its cooling stage we can observe how existence of heterogeneity controls cracking process. Mogi clearly showed the effect of heterogeneity in the fracturing process in his ingenious experiments using pitch mixed with coke. Here two types of interaction are clearly observed depending on the timing of the insertion at the cooling stage. Since chocolate has lower melting temperature/lower glass transition temperature it works as either a hard heterogeneity which enhances the stress field or a soft heterogeneity which relaxes the stress field depending on the timing of insertion. We report the significance of this effect.