Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

Geometry of a sheet crumpled into a ball[1] NARAYANAN MENON, DOMINIQUE CAMBOU, Dept of Physics, UMass Amherst — We use X-ray CT scanning to resolve in 3-dimensions the conformation of aluminum sheets with thickness t=25 microns crumpled into spherical balls with average volume fractions, ϕ ranging from 0.06 to 0.22. We have previously reported an inhomogeneous distribution of mass in the volume: the volume fraction increases with radius so that the sphere is densest at its surface. We now report on the geometry of the sheet, in particular we report on the distribution of Gaussian and mean curvature in the sample, with a view to quantifying the arrangement of regions of stress-focusing. A new feature apparent in the images is an unusually strong degree of stacking into multilayered facets. We quantify layering in the sample by reporting on the local nematic ordering of the sheet normals.

[1]Supported by NSF DMR 0606216 and NSF MRSEC DMR-0820506.

Narayanan Menon
Dept of Physics, UMass Amherst

Date submitted: 09 Dec 2009 Electronic form version 1.4