



Bulletin of the American Physical Society

APS March Meeting 2012
Volume 57, Number 1

Monday–Friday, February 27–March 2 2012; Boston, Massachusetts

[APS Home](#) | [APS Meetings](#) | [Join APS](#) | [Help](#)

[Bulletin Home](#)

[My Scheduler](#)

[Epitome](#)

[Author Index](#)

[Session Index](#)

[Invited Speakers](#)

[Chair Index](#)

[Word Search](#)

[Affiliation Search](#)

[Using Scheduler](#)

[Bulletin PDFs](#)

Session P53: Disordered Systems: Packing

8:00 AM–11:00 AM, Wednesday, February 29, 2012

Room: 153B

Sponsoring Unit: GSNP

Chair: Lisa Manning, Syracuse University

Abstract ID: BAPS.2012.MAR.P53.5

Abstract: P53.00005 : Constraint percolation on hyperbolic lattices

8:48 AM–9:00 AM

[Preview Abstract](#)

[MathJax On](#) | [Off](#) ← [Abstract](#) →

Authors:

Jorge Lopez
(Physics Department, Syracuse University)

J.M. Schwarz
(Physics Department, Syracuse University)

Constraint percolation models include constraints on the occupation of sites to, for example, better understand the onset of glassiness in glass-forming liquids. The dynamical glass transition in the Fredrickson-Andersen model simplifies to the study of the percolation transition in k -core percolation where every occupied site must have at least k occupied neighbors. Other constraint percolation models, such as force-balance percolation, have been introduced to begin to account for mechanical equilibrium on each particle arising during the onset of jamming. To study a mean-field-like version of force-balance percolation in which the directionality of forces becomes important, we consider clusters with occupied particles satisfying the $k = 3$ -core condition and lying inside a triangle determined by three of its occupied neighbors. The model is constructed on a tessellation of the Poincaré disk, thus, bearing a hyperbolic structure. Models on such spaces exhibit mean-field-like behavior and also play an important role in generating geometric frustration in glassy systems. We analytically investigate the conditions under which there exists a transition as well as the underlying nature of the transition. We also present numerical results to compare with our analytical results.

To cite this abstract, use the following reference: <http://meetings.aps.org/link/BAPS.2012.MAR.P53.5>