Applying the model of Soft Glassy Rheology to slowly driven dense granular matter[1] DAPENG BI, BULBUL CHAKRABORTY, Brandeis University — In recent work by S. Henkes and B. Chakraborty (PRL 95, 198002 (2005)), a new statistical framework is proposed to describe static granular packings. In this framework, stress replaces energy as the conserved quantity and fluctuations in the stress are controlled by a quantity analogous to the thermodynamic temperature. We adapt this framework in the quasi-static limit and the model of Soft Glassy Rheology (P. Sollich, PRE 78, 2020 (1997)) to describe the rheological behavior of slowly driven dense granular matter. The model explains the experimental observation of R. P. Behringer et al. (Nature 421, 928 (2003)). We will describe ongoing efforts to apply this model to different categories of slowly driven granular media, and to relate the model to threshold critical dynamics in other driven random media.

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Date submitted: 19 Nov 2008   Electronic form version 1.4