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Thomas Garrity* (tgarrity@williams.edu), Dept. of Mathematics and Statistics, Williams College, Williamstown, MA 01267. *On a Thermodynamic Classification for Real Numbers*. Preliminary report.

A new classification scheme for real numbers is proposed, motivated by ideas from statistical mechanics in general and work of Knauf and of Fiala and Kleban in particular. For each real number we associate a partition function and ask about the nature of the corresponding free energy. We will see that the diophantine properties of the initial number's continued fraction expansion determines critical properties for the corresponding free energy function. (Received September 12, 2008)