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**Sourav Chatterjee\*** ([sourav@stat.berkeley.edu](mailto:sourav@stat.berkeley.edu)), 367 Evans Hall #3860, Department of Statistics, Berkeley, CA 94720-3860. *Spin glasses and Stein's method.*

The high temperature phase of the Sherrington-Kirkpatrick model of spin glasses is solved by the famous Thouless-Anderson-Palmer (TAP) system of equations. The only rigorous proof of the TAP equations, based on the cavity method, is due to Michel Talagrand. The basic premise of the cavity argument is that in the high temperature regime, certain objects known as ‘local fields’ are approximately gaussian in the presence of a ‘cavity’. In this talk, I will show how to use the classical Stein’s method from probability theory to discover that under the usual Gibbs measure with no cavity, the local fields are asymptotically distributed as asymmetric mixtures of pairs of gaussian random variables. An alternative (and seemingly more transparent) proof of the TAP equations automatically drops out of this new result, bypassing the cavity method. (Received September 15, 2007)