



Contribution ID: 74

Type: **not specified**

## Modeling the shapes of dark matter halos

*Wednesday, April 20, 2011 5:10 PM (15 minutes)*

We combine the physics of the ellipsoidal collapse model with the excursion set theory to study the shapes of dark matter halos. In particular, we develop an analytic approximation to the nonlinear evolution that is more accurate than the Zeldovich approximation, and we provide simple physical explanations for some empirical fitting formulae obtained from numerical studies. Comparison with simulations is challenging, as there is no agreement about how to define a non-spherical gravitationally bound object. Nevertheless, we find that our model matches the conditional minor-to-intermediate axis ratio distribution rather well, although it disagrees with the numerical results in reproducing the minor-to-major axis ratio distribution. We suggest that some of the disagreement with some previous numerical studies may be alleviated if we consider only isolated halos.

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**Session Classification:** Contributed Talks