

Anelastic Benchmark Discussion at KITP
Wednesday 2nd July 2008-07-02

Some purely hydrodynamic anelastic spherical benchmarks using the Leeds code are now up on the KITP wikispace. These currently have a density ratio across the shell of $\exp(5) \sim 150$, and there was some feeling this might be a bit ambitious. Nevertheless, Sacha Brun and Mark Miesch are adapting the ASH code to see if they can get similar results to those from the Leeds code. It was suggested that at this early stage it would be unwise for other groups to be doing too much detailed comparison work, as it may be necessary to change the benchmarks in the light of comparisons between the ASH and Leeds codes. After this initial phase is completed, and the final benchmarks agreed, we will inform others who can then test their individual codes.

A number of points arose in the discussion:

- (1) We should make sure that the benchmark cases don't require massive computational resources. One possibility to help with this might be to have some benchmarks with an applied azimuthal symmetry, which are then more likely to be steady in a drifting frame, making for easier comparison.
- (2) It might be desirable to have a low rotation benchmark, perhaps Rossby number order unity.
- (3) If there was a benchmark steady in a drifting frame, it could be used to test fully compressible codes, as there would be no sound waves in the final state.
- (4) To keep things simple, there should not be too many different benchmarks.