Large-scale power in the CMB and new physics: an analysis using Bayesian model comparison Anastasia Niarchou, Andrew H. Jaffe and Levon Pogosian Blackett Laboratory, Imperial College London, SW7 2AZ, United Kingdom

abstract One of the most tantalizing results from the WMAP experiment is the suggestion that the power at large scales is anomalously low when compared to the prediction of the “standard” ΛCDM model. The same anomaly, although with somewhat larger uncertainty, was also previously noted in the COBE data. In this work we discuss possible alternate models that give better fits on large scales and apply a model-comparison technique to select amongst them. We find that models with a cut off in the power spectrum at large scales are indeed preferred by data, but only by a factor of 3.6, at most, in the likelihood ratio, corresponding to about “1.5σ” if interpreted in the traditional manner. Using the same technique, we have also examined the possibility of a systematic error in the measurement or prediction of the large-scale power. Ignoring other evidence that the large-scale modes are properly measured and predicted, we find this possibility somewhat more likely, with roughly a 2.5σ evidence.