Abstract Submitted
for the APR21 Meeting of
The American Physical Society

An algorithm to locate the centers of baryon acoustic oscillations in real-space ZACHERY BROWN, REGINA DEMINA, GEBRI MISHTAKU, CHAD POPIK, University of Rochester — Acoustic waves in the primordial Universe (baryon acoustic oscillations, BAO) generated spherical shells of matter over-density, which can be detected today in redshift surveys as a preferential length scale between galaxies. We report on an algorithm, CenterFinder, which extends BAO detection beyond a simple length scale, to include the cosmic locations of these primordial over-densities in real-space. Our method creates a model template of the expected matter distribution around over-dense BAO centers, then convolves it with the matter density distribution as traced by galaxies to achieve this goal. Using mock galaxy catalogs, we evaluate the success and robustness of the algorithm by cross-correlating our probable BAO centers with the galaxies themselves. This method is a new and unique probe of the BAO length scale, in addition to its ability to locate BAO centers in real-space.

Zachery Brown
University of Rochester

Date submitted: 08 Jan 2021 Electronic form version 1.4