

Analysis of Red Giant Oscillations from a 27 Day ACS/WFC Time-Series on NGC 6397

Principal Investigator: Dr. Ronald L. Gilliland

Institution: Space Telescope Science Institute

Electronic Mail: gillil@stsci.edu

Scientific Category: COOL STARS

Scientific Keywords: GIANTS AND AGB STARS, GLOBULAR CLUSTERS, LOW-MASS AND COOL STARS, STELLAR EVOLUTION AND MODELS, VARIABLE AND PULSATING STARS

Total Budget Amount: \$10,790

Abstract

Observations of solar-like oscillations have started to provide excellent results with firm detections in recent years for dwarfs, subgiants and red giant stars -- all with radial velocities. We are now poised to further exploit these recent successes with more systematic exploration of oscillations in stars across the color-magnitude diagram (CMD). Giants are of particular interest as allowing tests of stellar structure and evolution in this complicated time in a stars life, while presenting observational signals of much larger amplitude than for dwarfs.

Study of stellar oscillations requires unusual combinations of long time coverage to obtain the requisite frequency resolution, and precision to detect the fraction of a mmag amplitude modes to be studied here. Time coverage of one week is a lower limit for study of modes which in the giants will have periods of 0.25-3 days, while intensive observations over multiple weeks would be ideal. We will show excellent success at detecting oscillations in giants (all of which are strongly saturated in these data) from a 7 day observation program (GO 9750) conducted for extrasolar planet detection in the galactic bulge. This proposal is for analysis of giants serendipitously observed as part of GO-10424 a 126 orbit program with ACS/WFC on NGC 6397 to probe the bottom of the white dwarf cooling sequence. These ~400 exposures over 27 days for NGC 6397 will allow asteroseismic results on ~40 giants, including mode lifetime estimates not possible at only 7 days.

Analysis of Red Giant Oscillations from a 27 Day ACS/WFC Time-Series on NGC 6397

Investigators:

	Investigator	Institution	Country
PI	Dr. Ronald L. Gilliland	Space Telescope Science Institute	USA/MD
CoI	Dr. Dennis Stello	University of Sydney	Australia

Number of investigators: 2

Dataset Summary:

Instrument	No. of Datasets	Retrieval Method	Retrieval Plan
ACS	390	FTP	Standard archive access for .flt files spread over a few days for GO-10424