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Title:		Absolute Magnitude Calibrations of Population I and II Cepheids and Other Pulsating Variables in the Instability Strip of the Hertzsprung-Russell Diagram
Authors:		Sandage, Allan ; Tammann, Gustav A.
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Abstract

The status of the absolute magnitude calibrations is reviewed for the long period Cepheids of population I and II, RR Lyrae stars, evolved "above horizontal branch" (AHB1) variables (periods 0.8 to 3 days), dwarf Cepheids of both populations (the Delta Scuti and SX Phoenicis variables), and the anomalous Cepheids (AC). Evidence shows that the period-color and period-luminosity (P-L) relations for population I Cepheids in the Galaxy and in the Large and Small Magellanic Clouds have different slopes and zero points. This greatly complicates use of Cepheids for the extragalactic distance scale. Strategies are discussed to patch the problem. A consensus exists for the long distance scale for RR Lyrae stars whose calibrations favor $M_V(\text{RR}) = 0.52$ at $[\text{Fe}/\text{H}] = -1.5$. Exceptions exist for "second parameter" clusters where the variation of the morphology of the horizontal branch with metallicity is anomalous, the most blatant being NGC 6388 and NGC 6441. The status and calibrations of AHB1 and AC show that different evolutionary paths and masses explain the difference P-L relations for them. AC appear predominantly in the dwarf spheroidal galaxies, but are almost absent in Galactic globular clusters. AHB1 stars are absent in dwarf spheroidals but are present in globular clusters. The difference may be used to study the formation of the remote Galactic halo if it is partially made by tidal disruption of companion dwarf spheroidals.