

## Design Concept for Microwave Interrogation Structure in PARCS

G.J. Dick,<sup>1</sup> T. Heavner,<sup>2</sup> S.R. Jefferts,<sup>2</sup> and W.M. Klipstein<sup>1</sup>

<sup>1</sup>Jet Propulsion Laboratory, California Institute of Technology  
Pasadena, California

<sup>2</sup>National Institute of Standards and Technology  
Boulder, Colorado

We will present our current design ideas for the microwave structure intended for Ramsey interrogation in PARCS, a laser-cooled cesium atomic clock to be flown on the International Space Station. The PARCS flight cesium instrument will use balls of cold atoms launched in a pulsed beam configuration. The microwave interrogation will take place in two independent high-Q ( $\sim 20,000$ ) cavities operated in the  $TE_{011}$  mode. The cavities will be operated off resonance by several linewidths, with a resonant structure delivering the microwaves to the two cavities. One persistent problem related to the end-to-end phase shift has been the extreme temperature sensitivity of the phase inside the cavities to that just outside the cavities. The end-to-end phase shift must ultimately be known to around 1 microradian, and stable long enough to allow measurement of the shift as well as normal clock operation. Operating the cavities off resonance reduces this sensitivity more strongly than reducing the cavity Q. We will discuss details of the design and their implications for the end-to-end phase shift and operation of the PARCS flight cesium instrument.

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Poster preferred

Corresponding author:

Bill Klipstein

MS 298-100

4800 Oak Grove Drive

JPL

Pasadena, CA 91109

Phone: 818 354 2245

FAX: 818 393 6773

Email: [klipsein@jpl.nasa.gov](mailto:klipsein@jpl.nasa.gov)