

Proposed MIT-CAST Contributions to SMTF Effort

- Undergraduate/graduate accelerator physics students.
- Design & construction of amplifier/tuner set for lightly loaded SRF cavities.
- Development of RF detector/controller. Integration of TESLA style design w/ high level EPICS support.
- ILC 10 MW modulator development.
- Electron & optical beam instrumentation.
- Timing and synchronization systems.
- Beam physics simulation.

MIT Center for Accelerator Science & Technology

MIT has proposed to DOE the creation of a Center for Science and Technology (CAST). CAST will:

- Educate students in accelerator science - producing 3-5 PhD's per year.
- Support accelerator infrastructure for the needs of the USPAS - MIT hosted USPAS in 1993 w/ hands on use of the Bates accelerator. This concept has been strongly endorsed by the USPAS. Possible summer school at Bates in Summer 2006.
- Develop cutting edge accelerator technologies necessary to construct and operate the next generation of machines

Nuclear Physics program using Bates will end, but DOE is supporting Research and Engineering efforts at Bates Lab for other Nuclear and Particle Physics projects.

MIT CAST Related Activities

W. Bertozzi, D. Cheever, M. Farkhondeh, J. Flanz, W. Franklin, W.S. Graves,
E. Ihloff, F. Kaertner, J. van der Laan, R. Milner, D.E. Moncton, K. Nelson, W. North,
S.G. Steadman, C. Tschalaer, E. Tsentalovich, R. Temkin, Defa Wang, Dong Wang,
F. Wang, A. Zolfaghari, T. Zwart

MIT is hosting a series of seminars on Accelerator Science & Technology

MIT Physics Department has launched a faculty search that includes the field of Accelerator Science

<http://web.mit.edu/physics/facultyandstaff/employment/acad.html>

Amplifier / Tuner Set

For Lightly Loaded SRF Cavities

T. Zwart, D. Cheever, W.S.Graves, W. North, Defa Wang, A. Zolfaghari
MIT Bates Accelerator Center

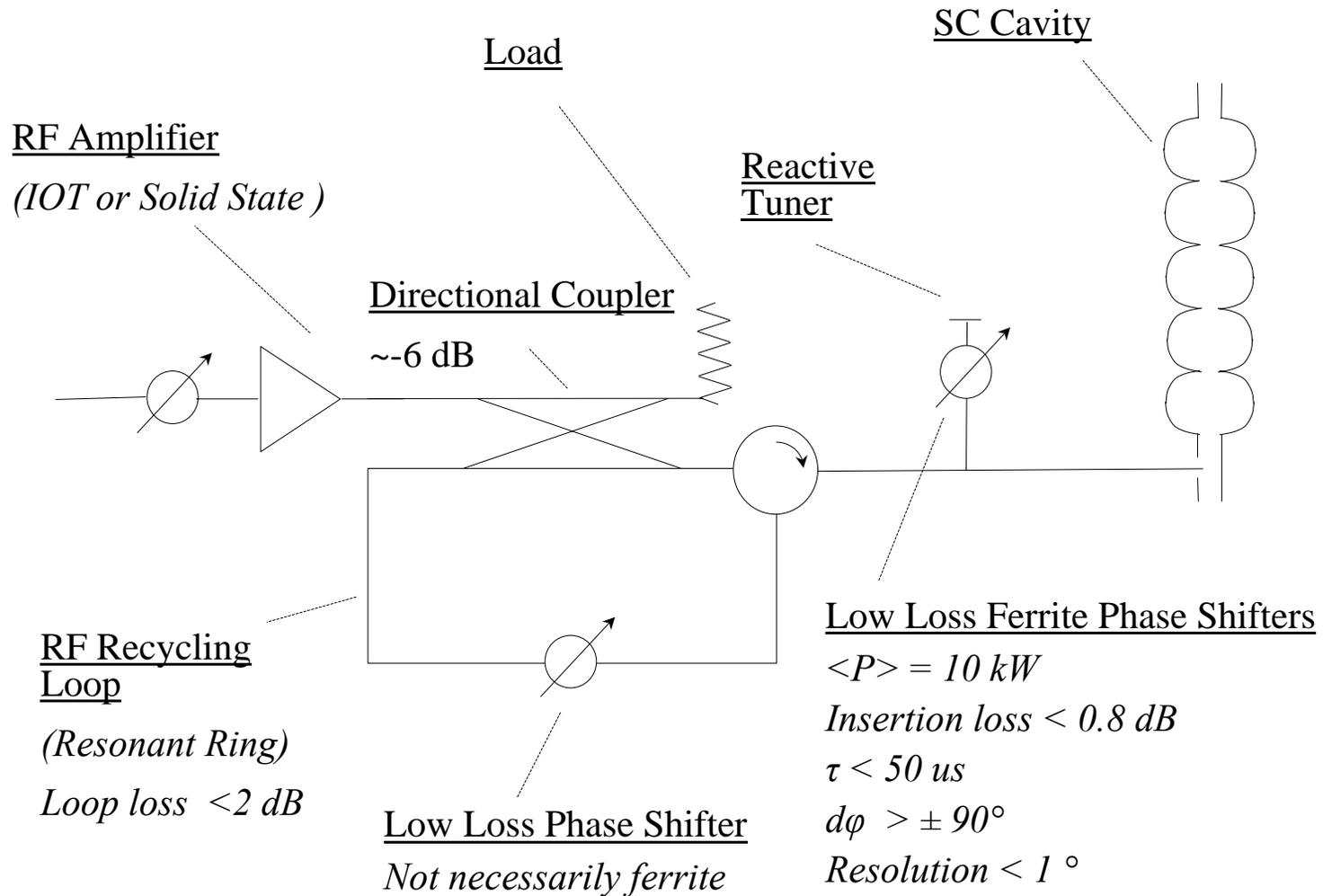
MIT proposes to design and construct an RF amplifier/tuner set for lightly loaded SRF cavities. Baseline effort includes:

- IOT Amplifier
- Reactive Ferrite Tuner
- Resonant Ring RF recycling loop
- Controller

Coordination with other interested labs is essential.

MIT has proposed this effort to DOE as part of its Center for Accelerator Science & Technology (CAST) Initiative. Amp/tuner system could be assembled at MIT, tested into a warm dummy load and transported to appropriate SMTF for qualification.

Reactive Tuner with Resonant Ring



Reactive Tuner with Resonant Ring

Beam & Cavity Power	Circulator Loss (dB)	Phase Shifter Loss (dB)	Other Loss (dB)	Total Loss (dB)	Dir. Coupler (dB)	Power Gain (G)	P_{ring} (kW)	P_{source} (kW)
240	0.00	0.00	0.00	0.16	14.4	27.3	10	<0.4
240	0.35	0.35	0.14	1.00	6.8	4.8	10	2.1
240	0.45	0.45	0.14	1.20	6.1	4.1	10	2.5
240	0.60	0.60	0.14	1.50	5.3	3.4	10	3.0
240	0.70	0.70	0.14	1.70	4.9	3.0	10	3.4
240	0.80	0.80	0.24	2.00	4.3	2.7	10	3.7