

RF Support For Test Facilities

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- This talk focuses on HLRF, LLRF covered by Brian Chase
- A0 test facility
- Meson facility
- Vertical Test facility
- NML facility
- **What equipment/infrastructure is needed ?**
- **Why is this useful beyond just ILC ?**
- **What it will cost**
- Conclusion



RF Support for Test Facilities



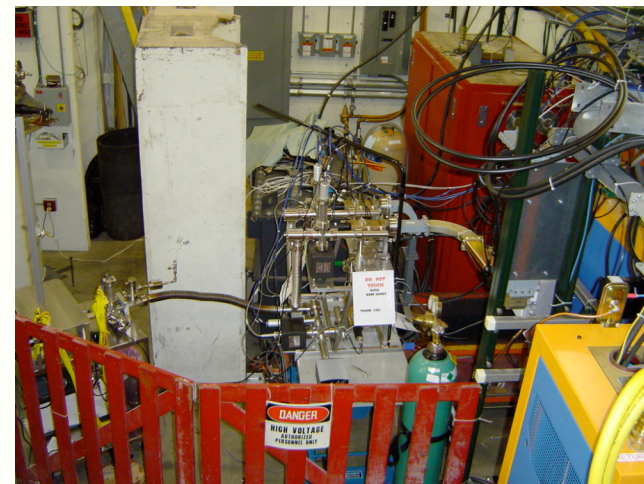
- **A0 Test Facility**
- 3.9 GHz 80 KWatt Klystron for Coupler Testing at A0
 - All RF components installed at A0
 - System has been power tested into dummy load.
 - Checked system interlocks operating into dummy load.
 - Connected waveguide to coupler test fixture the last week of December 2006.
 - High Level RF system ready for coupler processing.

A0 Test Facility



3.9 GHz 80 KWatt Klystron

3rd Harmonic Coupler Test

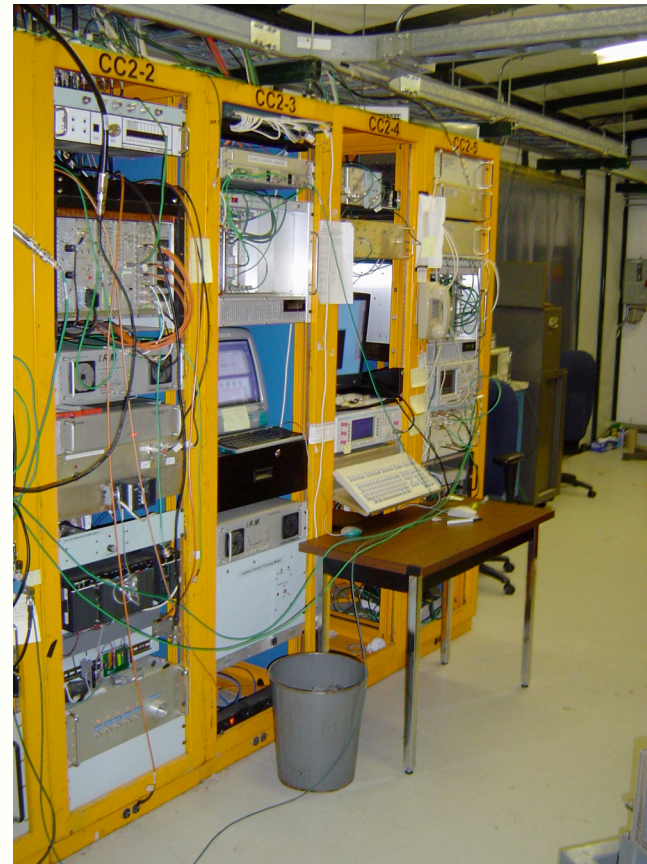
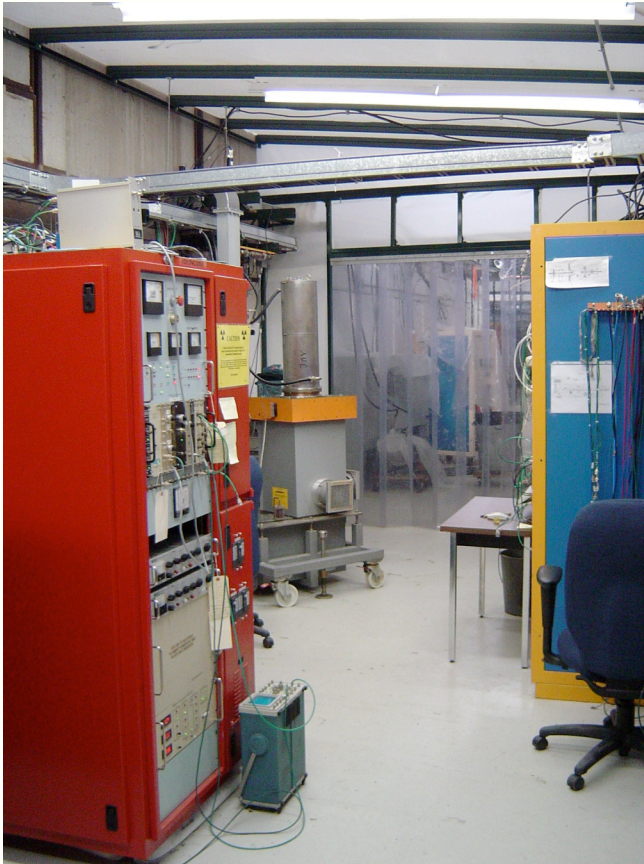


- **Meson Test Facility Capture Cavity II Status**

- Cavity warmed up on 9-11-06 to perform scheduled repairs to tuner motor and address low frequency modes.
- Tuner motor replaced.
- Stiffeners added across bellows on ends of cavity to reduce low frequency modes.
- Thermometry added to tuner motor housing & windings.
- Thermometry added to HOM's.
- Input coupler restraint was removed.
- Cryomodule end plates are back in place 11-27-06
- In late December, cavity was cooled down to 2 K and performance was verified at ~ 30.5 MV/M.
- Present plans are to continue working with LLRF closed loop system performance.
- Start work on Piezo compensation for Lorenz force detuning

- **Meson Test Facility 300Kwatt Klystron Status**
- On 9-25-06 installed the second rebuilt YK-1240 Klystron tube S/N SK-4
- Existing tube removed only to test & condition second rebuilt tube.
- SK-4 showed large amount of out-gassing with only filament (heater) power.
- Tube took over 3 weeks with gradual increase in filament power to reach rated filament voltage while keeping ion pump current below 15 uAmps.
- Started HV pulsing (no RF) with 70 uSec wide pulses at a 1 Hz rate. Cathode HV set to 35 Kvolts (typically op at 60 Kv). Ion pump current about 10 to 12 uAmps.
- Late in December 2006 S/N SK-4 removed and sent back to vendor for reprocessing.
- Reinstalled previous tube to run CCII.

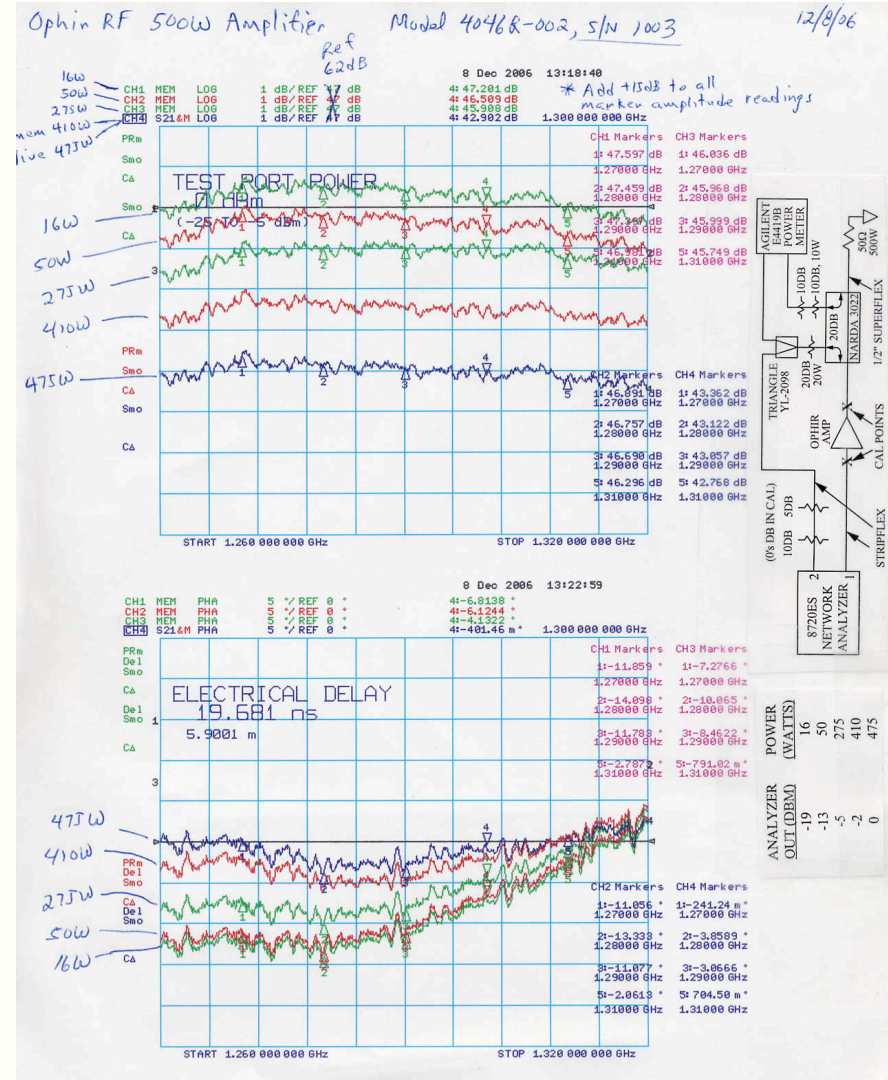
Meson Test Facility



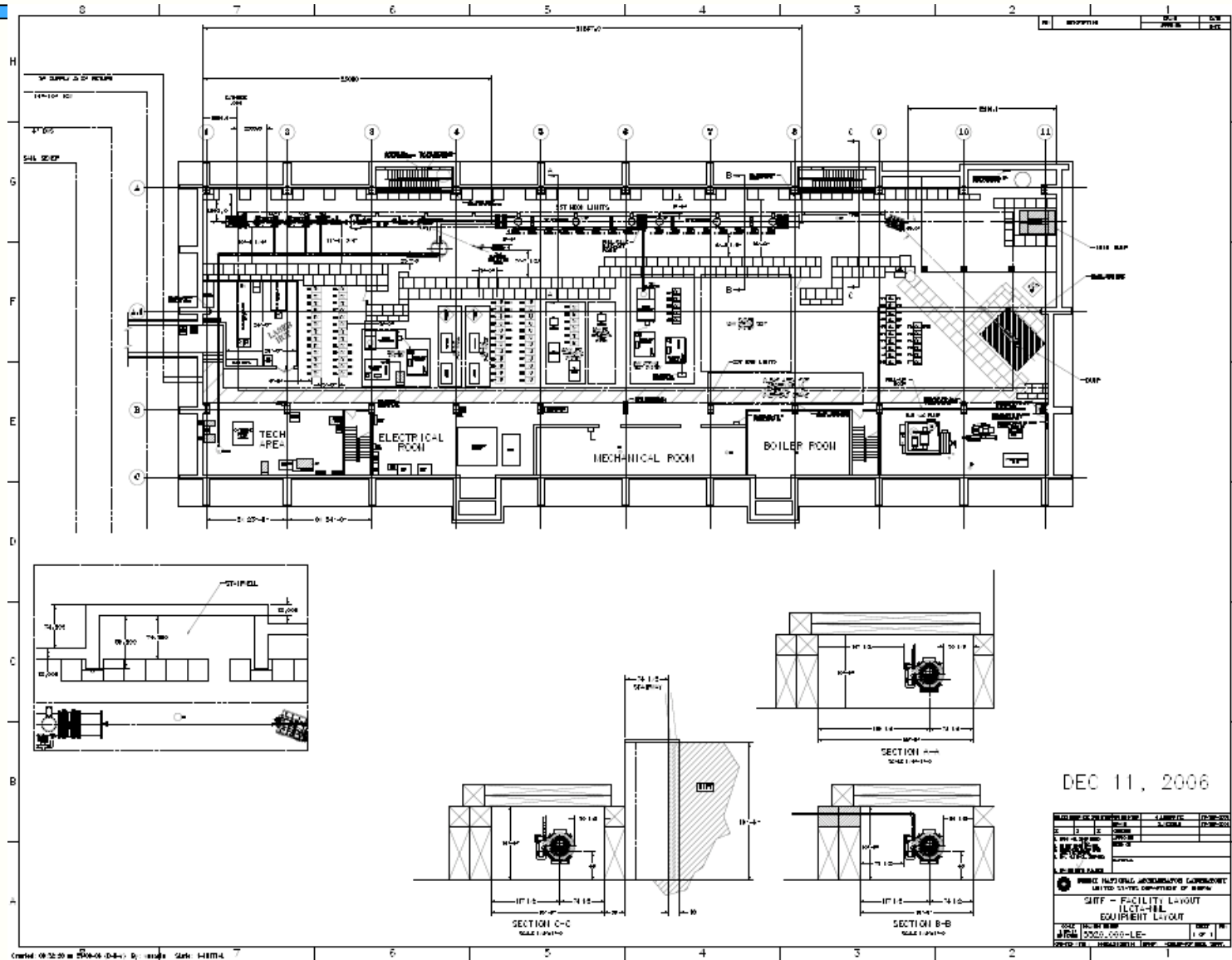
300 KWatt Klystron Test Stand

- **Vertical Test Facility**

- AD/RF Department has provided RF experts to review the RF design for the facility
- General consulting and review
- Complete characterization of the Ophir 500 Watt solid-state drive amplifier

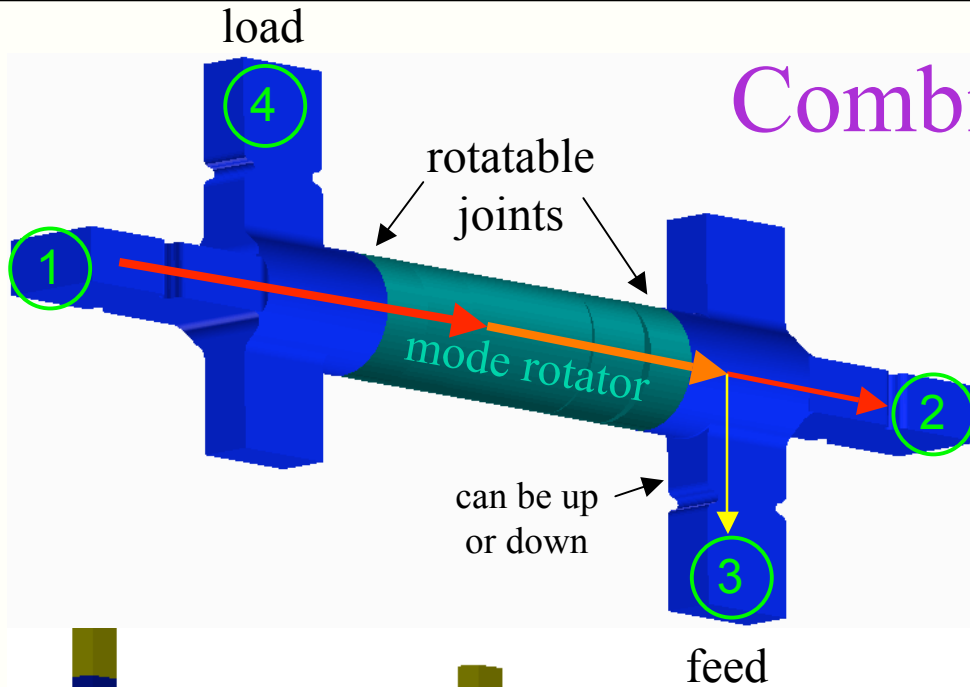


- **NML Test Facility FY 2007**
 - Now that building is almost ready for hardware, detailed planning is under way for RF installation
 - Floor plan in design includes several RF stations
 - Plans to install a 5 MWatt Klystron this fiscal year
 - SLAC to deliver a RF distribution system by end of fiscal year
 - Testing of first cryomodule warm by end of calendar year
 - Cryogenic testing of cryomodule dependent on budget



DEC 11, 2006

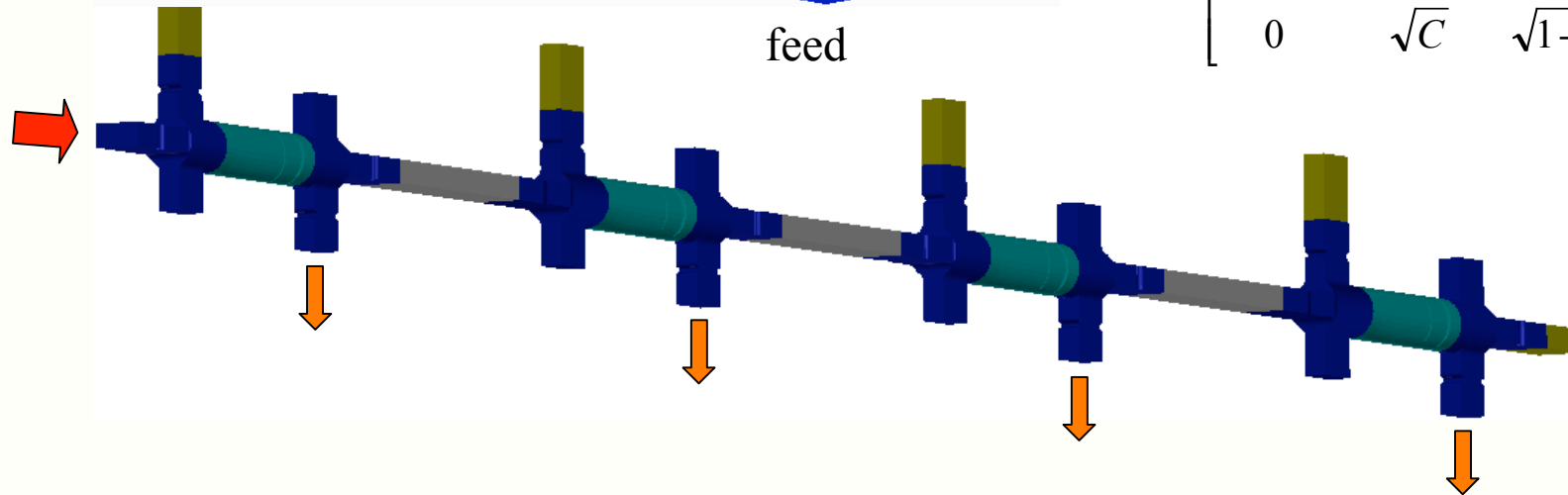
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Combined Component

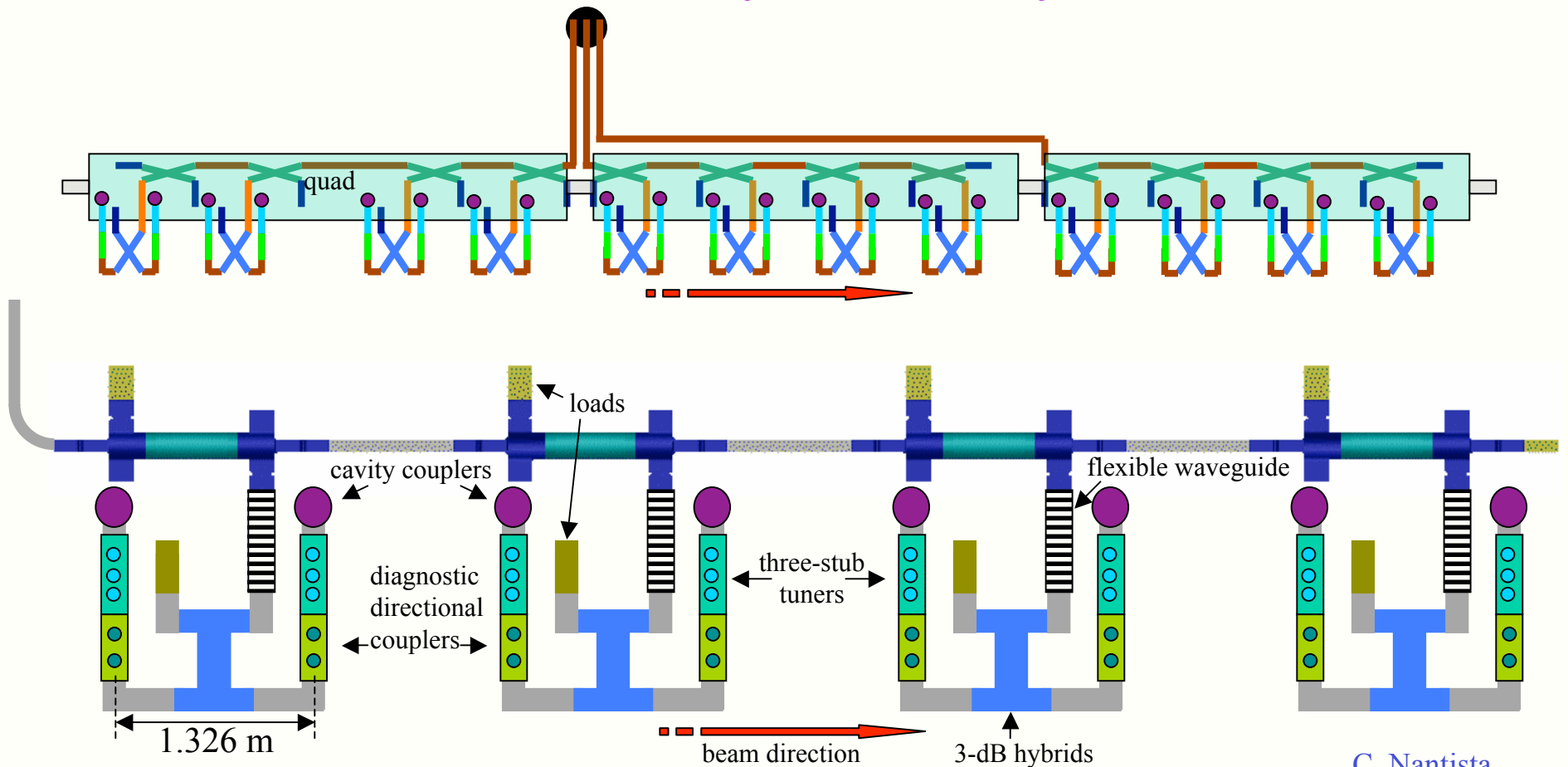
Directional Coupler

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C. Nantista

Distribution System Layout



- **NML Test Facility FY 2007 issues**
 - No funds to buy a new 5 MWatt klystron
 - Install a klystron from A0 that has a large number of hours of operation
 - SLAC has a spare 5 MWatt klystron tested for a spare for their test stand, can be considered a spare for NML with one week's notice
 - SLAC will keep 5 MWatt circulator until testing of a 5 cell room temperature cavity is completed spring 2007
 - Preparing a list of required components to do initial testing. Procurement on hold pending budget
 - SLAC has procured limited number of components. Orders for RF distribution hardware must be placed soon to meet current schedule.
 - Eliminating phase shifters from first distribution system to save costs.

- **NML RF budget not clear as of 1/4/2007**

- **Budget is presenting significant challenge to meeting desired scope of work.**
- **Worst comes to worse, single 9 cell cavities could be tested without SLAC RF distribution hardware**
- **Questions ?**