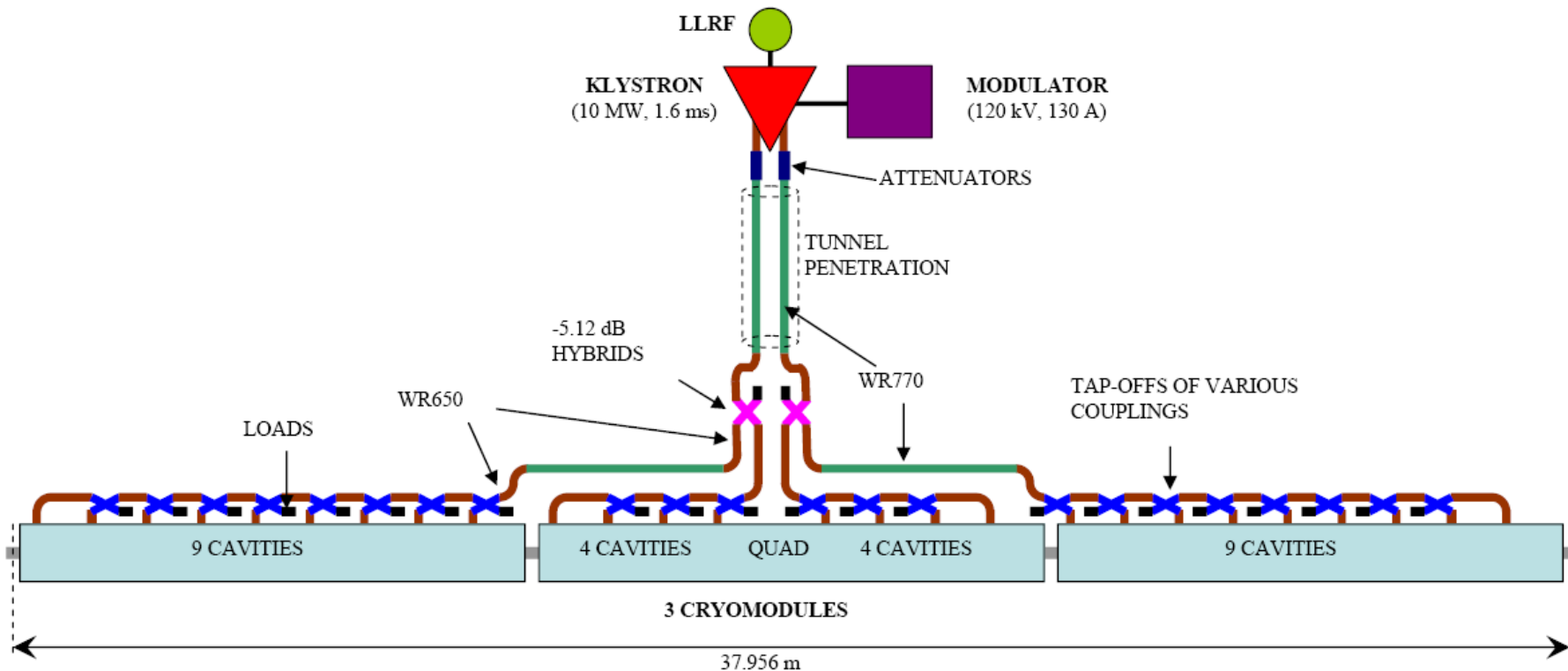


Radio Frequency (RF) Systems (LLRF and HPRF)

*Stefan Simrock, ITER
Zheqiao Geng, PSI*

- RF system overview
- Control Theory
- Low Level RF
 - Requirements
 - Sources of Perturbations
 - Control Concepts
 - RF Control
- High Power RF
 - Klystrons
 - Modulator
 - RF distribution

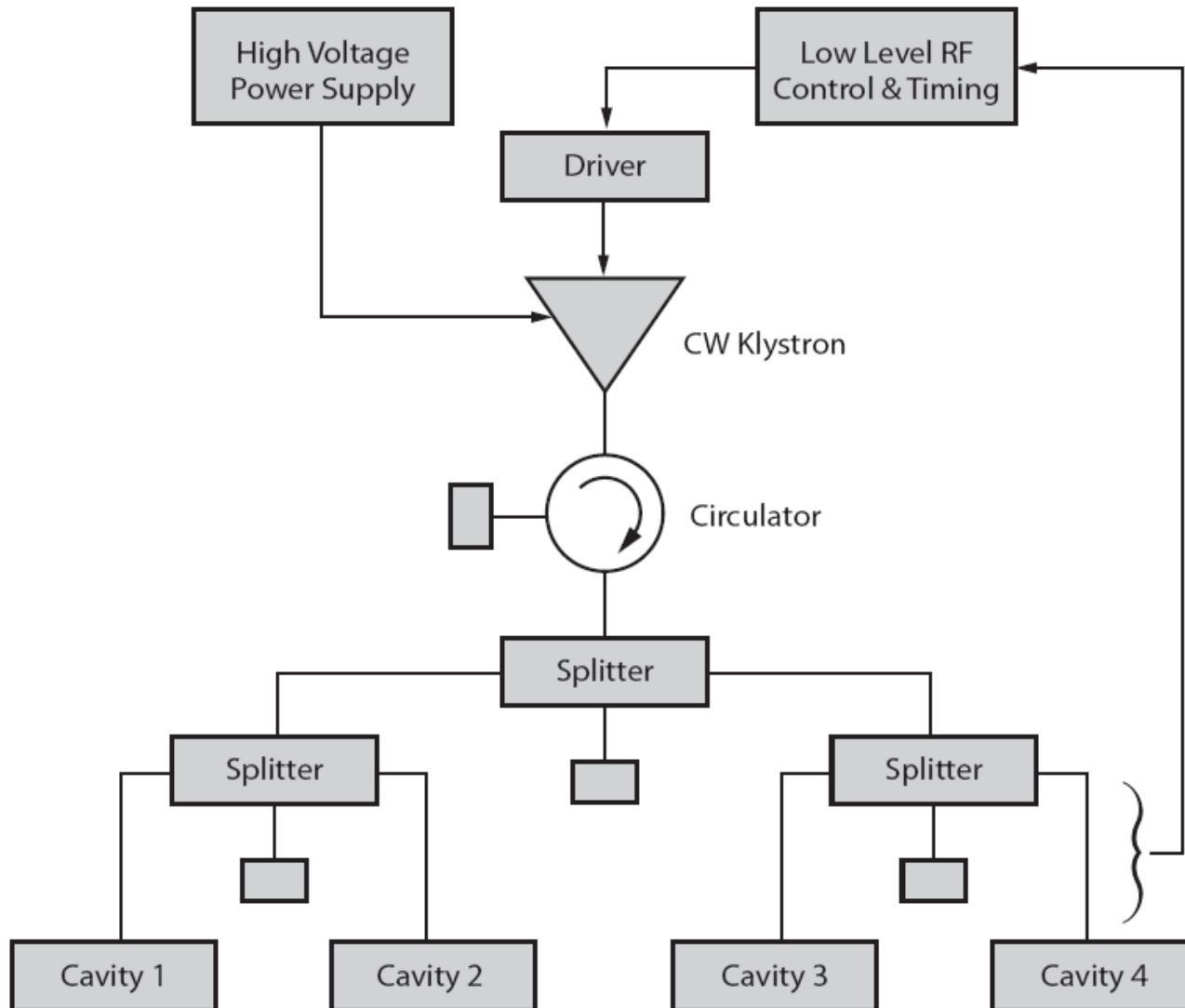


Modulator distribution by type and area.

Modulator type	Total	e ⁻ Inj	e ⁺ Inj	e ⁻ RTML	e ⁺ RTML	e ⁻ Linac	e ⁺ Linac	e ⁻ DR	e ⁺ DR
10 MW-1.3 GHz-5 Hz	646	13	39	17	17	282	278	0	0
1.2 MW-650 MHz-CW	20	0	0	0	0	0	0	10	10



Schematic for Damping Ring RF Station





ILC RF Unit for Main Linacs (x560)

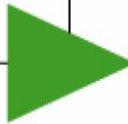
Modulator
(120 kV, 140 A)



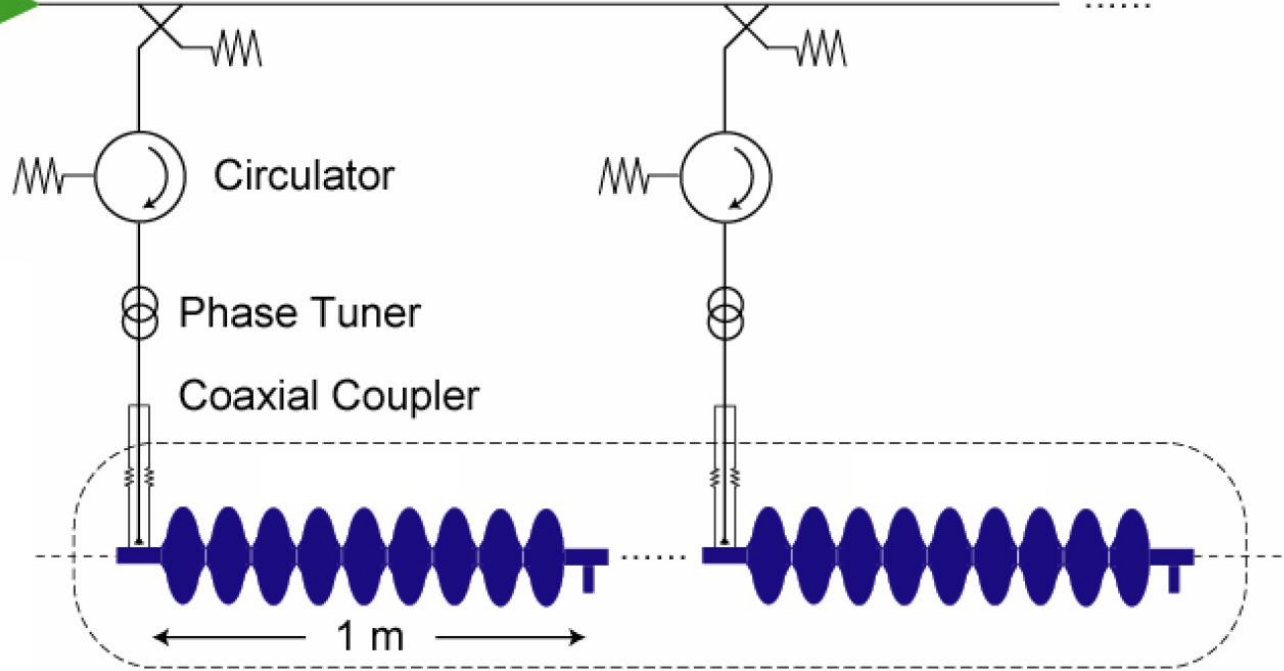
1.3 GHz



10 MW Klystron
(1.4 ms, 5 Hz)



RF Transmission Line



- Gradient = 31.5 MV/m
- Rep Rate = 5 Hz
- # of Bunches = 1312
- Bunch Spacing = 554 ns
- Beam Current = 5.8 mA
- Train Length = 727 μ s

Cryomodule 1 of 3

(9-8-9 Cavities per Cryomodule)



Integration LLRF, HPRF, Timing/Synchronization

