ACD,technology choice & Plug-in of Cavity Peripherals

Technology decision/down-selection of ACD, non-RDR, and relation to Plug-in for Cavity Package

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Issues on Cavity Package

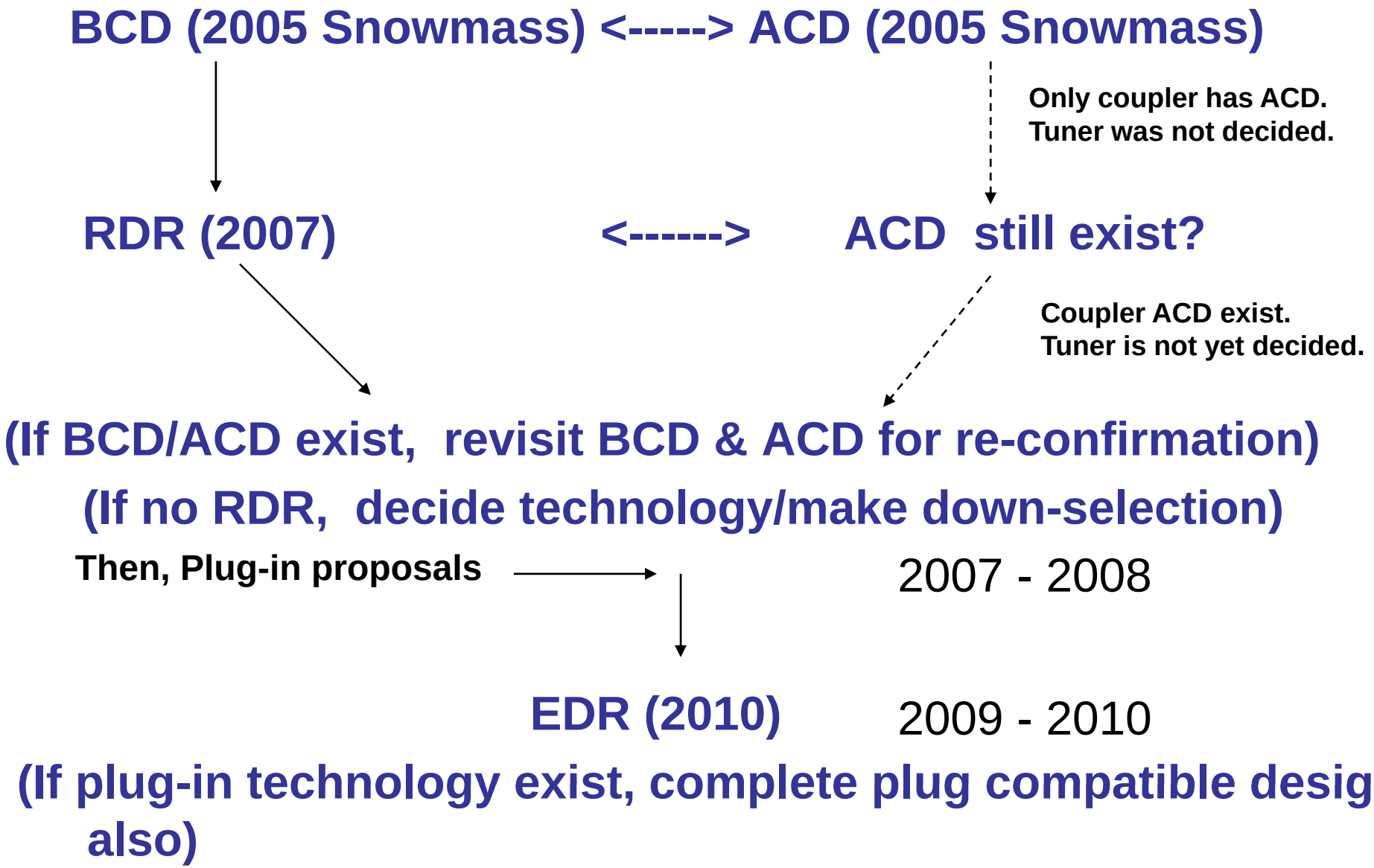
Cavity package

1. Lorentz detuning compensation (specification, method, required rigidities, fast tuning specification,…) <decided by beam quality specification, rf power margin, LLRF performance, cavity performance spread>
2. Coupler selection (variable coupling, fixed coupling) <decided by cavity performance spread, rf power margin>
3. Tuner selection (Saclay tuner, Brade tuner, Slide-jack tuner, Ball-screw tuner,..)
   <decided by rigidity related to Lorentz detuning compensation>
4. Piezo maintenability (Piezo life, accessibility, install position, how many)
5. Tuner motor maintenability (motor inside/outside)
6. Alignment method (method, specification, cavity straightness, reference point,..)
7. Magnetic shielding method (inside or outside vessel)
8. Helium vessel material (Ti or SUS, …)
9. Assembly procedure in clean room (detailed procedure in clean room)
10. High Pressure Vessel regulation (same as cavity)
11. HOM probe, monitor antenna (detail engineering for materials, treatment, insulator, brasing, RF design)
12. Coupler peripherals(arc sensor, temp sensor, pumping, coupling adjuster,etc)

BCD/ACD/tech choice for Cavity Package

Item	BCD	RDR	ACD / technology choice
Tuner	not selected	not selected	Saclay tuner, Brade tuner, Slide-jack tuner, Ball-screw tuner
Motor position	not specified	not specified	motor inside, motor outside
Piezo maintenability	not specified	not specified	piezo inside(double?), accessible
Coupler	TTF-III(variable β),	TTF-III(variable β)	Two-disk Window type(fixed β), Capacitive coupling type(fixed β), TW60(fixed β), SLAC coupler?,…
Coupler peripheral	not specified	not specified	tmp/arc sensors, pumping,…
Magnetic shield	not specified	not specified	He vessel outside, inside
Vessel material	Titanium	Titanium	SUS
HOM probe,etc	not specified	not specified	feed-through,….
Alignment method	not specified	not specified	endplate+jig, machined endplate Invar fixing, slider hang,….

ACD or Plug-in



Technology down-selection, decision, & Timeline proposal

2007.10 - 2008. 3 : Make specification/parameter range table.
Identify the down-selection item, decision item.
Identify the proposer of the technology.
Make comparison tables of merits and points by each proposer.

2008. 4 - 2008. 5 : PM/TA Make fair-minded comparison table to be filled in by each proposer.

2008. 5 - 2008. 7 : Fill in the comparison table, and be documented.

2008. 8 PM/TA decide the technology according to the table.

2008. 9 - 2008. 12 : Identify plug-compatible proposals

2008. 9 - 2010. 8 : Start detail Engineering Design according to the decision (2 years)

Possible plug-compatible units

C1-level : Cryomodule

C2-level : Cryostat with GRP, He-pipes, and thermal shields.

C3-level: Cryostat vessel, GRP supports, Pipes, Thermal Shields, Invar fixture, Cavity support, Quad support, Cryostat Pumping system, Instruments(vacuum, temperature, etc) Installation fixture and method, Transportation fixture and method,

C2-level : Cavity package with He jacket, tuner and coupler,

C3-level: Cavity, Jacket, Magnetic shield, Tuner, Coupler, Instruments (RF cable, temperature sensor, piezo drive, etc)

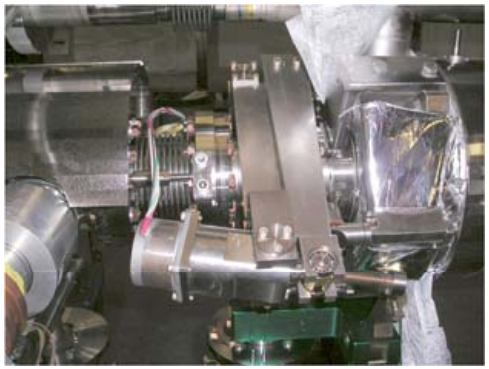
C2-level : Quad-steer-BPM package,

C3-level: Quad magnet, Steer dipole coils, Current feedthrough, BPM

C2-level : HOM absorber

C2-level : Beam line pumping

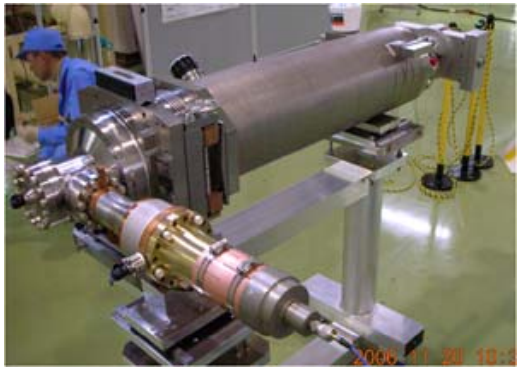
cavity package candidates



Saclay-I tuner package

Saclay-II tuner package

INFN
Blade tuner package



KEK Slide-jack tuner package

KEK Ball-screw tuner package