

Comments to ILC coupler designs

(very first thoughts, not knowing the project)

Eric Montesinos - CERN

Fuze meeting - 23 August 2013

Two windows

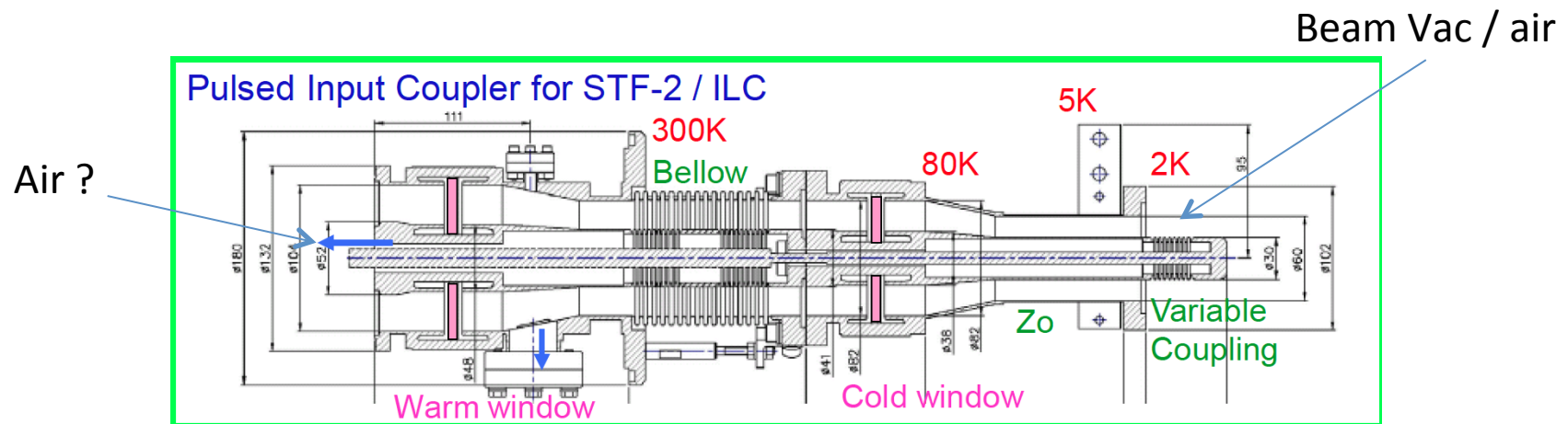
- Over ~ 250 LEP II coupler, after two years of operation, 1 window failure
- Not a major event, only cavity de-rating
- 16,000 couplers \rightarrow 2 windows design mandatory
 - $16,000/250 \times 1$ event per 2 years = 32 events per year

Qext

- Is the Qext range mandatory ?
- Can't we accept some discrepancies in Qext ?
- This could avoid cold below

KEK antenna bellow

- To my understanding of the drawing, antenna bellow breakage would lead into air into the cavity
- Double windows 'safety' is then cancelled

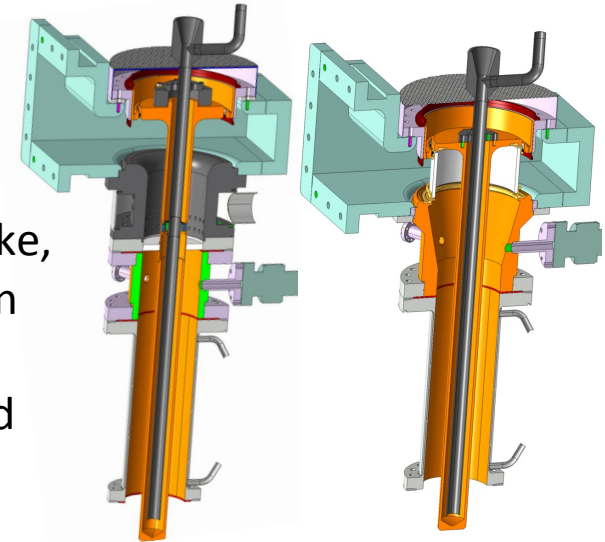


Window seen by the beam ?

- In the past, always avoided at CERN
- Now, we will try if Ti sputtering can also avoid electrostatic discharges
- KEK cold window is seen by the beam
- However, how Ti layer contact is guaranteed in choke design , behind the chokes ?

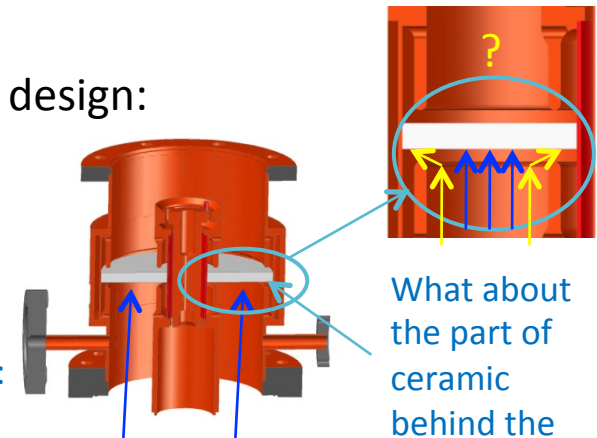
SPL design:

- disk window seen by the beam (no choke, Ti sputtering in contact with both inner and outer)
- Cylindrical window not seen by the beam



Toshiba disk design:

One coating:
 $R = 2 \text{ M}\Omega$



What about the part of ceramic behind the choke ?

Monitoring

- Does e- antenna mandatory ?
- Could simplify the construction & cleaning process
- Do we need vacuum monitoring ?
 - Easily integrated onto test box for first conditioning
 - None of the designs monitor beam vacuum side of the windows

Alternative proposal : Two cold windows ?

- Cold side as TTF coupler
- In addition, immediately a second cold KEK window
- Vacuum in between could be cryostat vacuum
- No bellows
- No e- ports, no vacuum gage port
- Could be integrated in clean room
- Warm side could then include below in cryostat flange and finger contacts in WG/inner line (CERN-SPL) for mechanical stresses
- Very easy to have reliable DC biasing (LHC-SPL-SOLEIL)
- Very first draft, to be worked on, schedule compatibility ?

