

Status of KEK High Gradient Cavities

Summary of Ichiro Cavities and Revision for Improvement

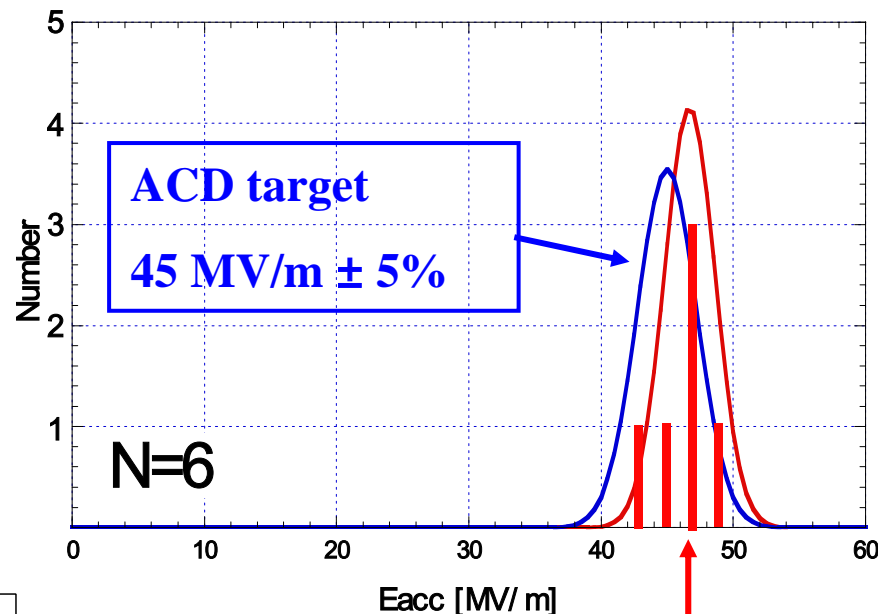
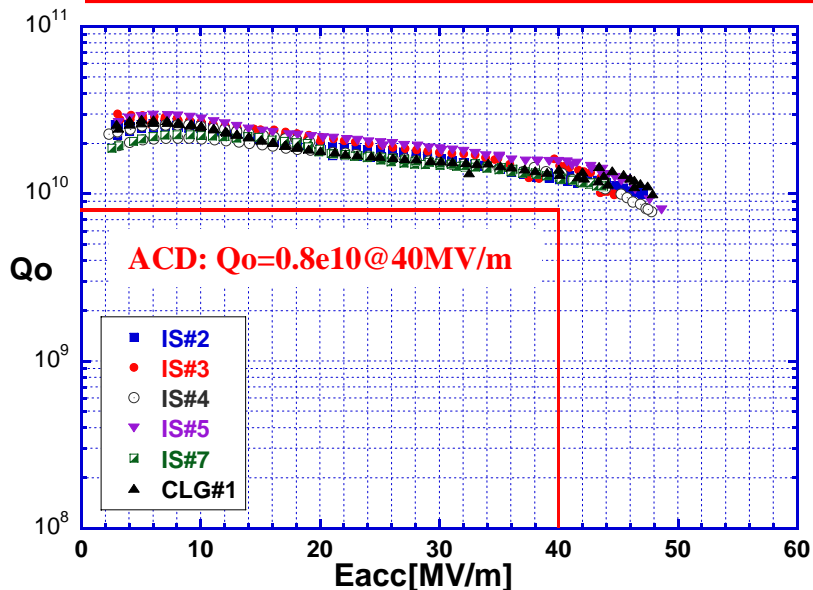
Furuta, Higashi, Hong, Morozumi, Saeki, Saito

High Gradient SRF Development
KEK

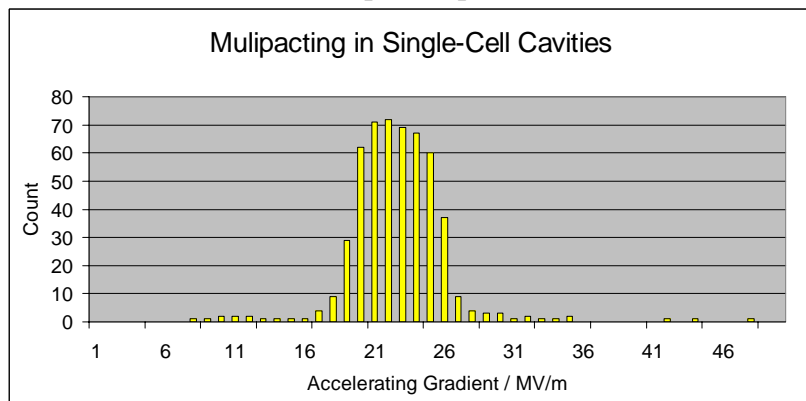
Summary of Ichiro Single-Cell Cavities

Current Best Prescription

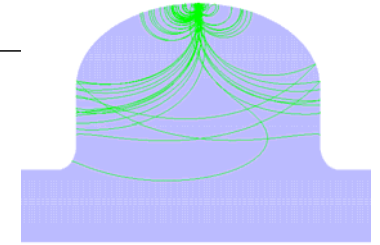
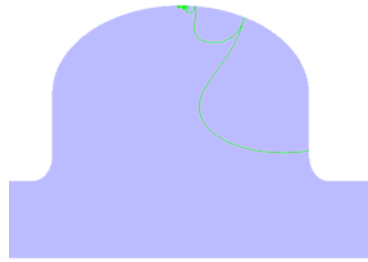
CBP(100~200 μ m)+CP(10 μ m)+Anneal(750C3h)+EP(80 μ m)+EP(20 μ m)
 +EP(3 μ m, fresh, closed) +HF(46%1h)+HPR(70atm1h)+Baking(120C*48h)



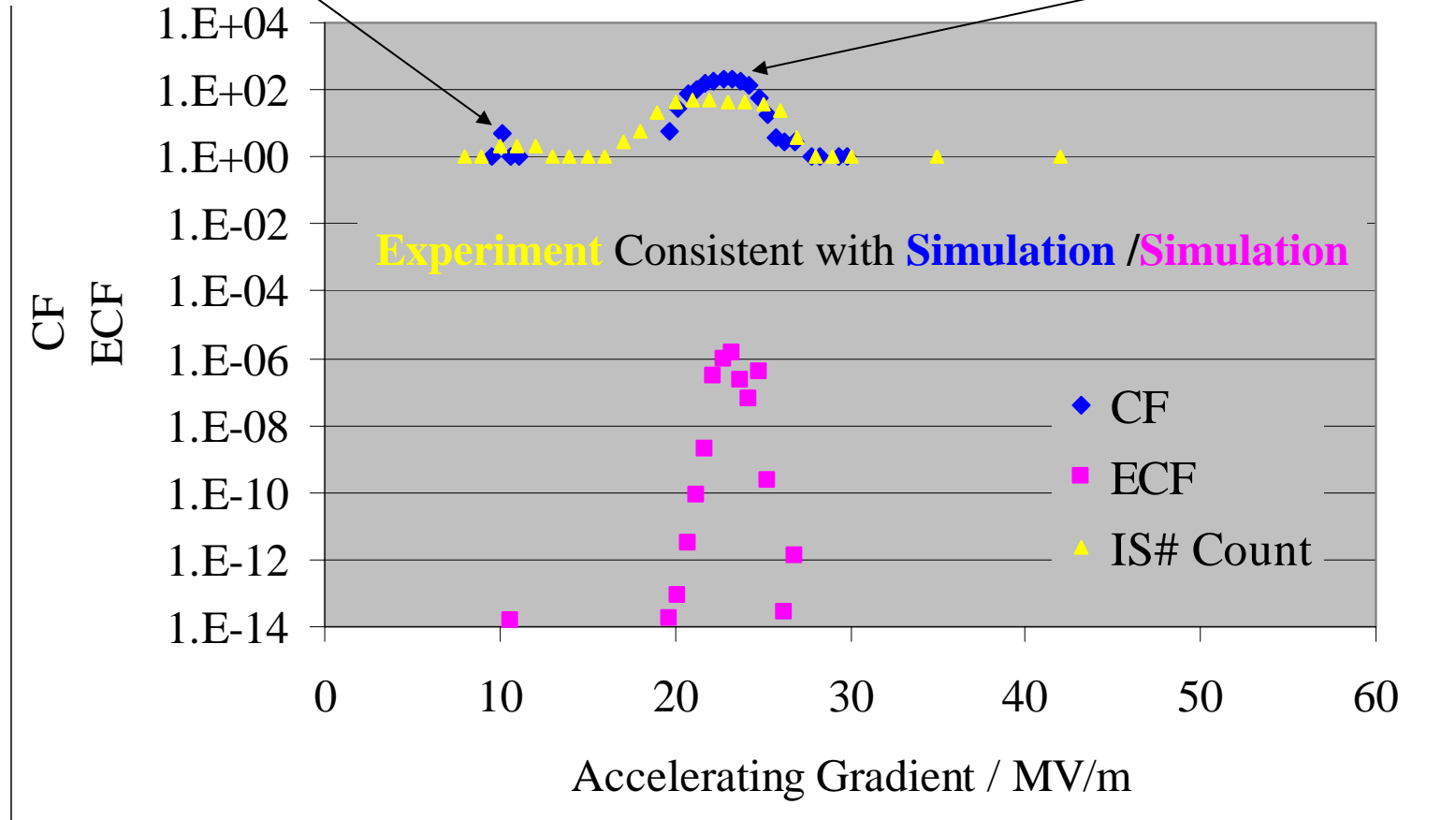
Six IS Cavities
Ave Eacc=46.7 \pm 4%



Multipacting in Single-Cell Cavities

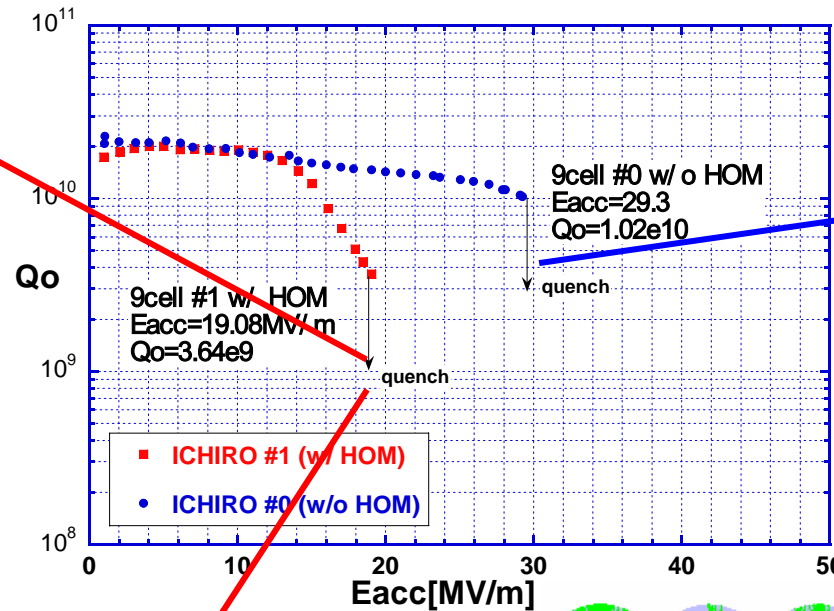


Multipacting in Single-Cell Cavities

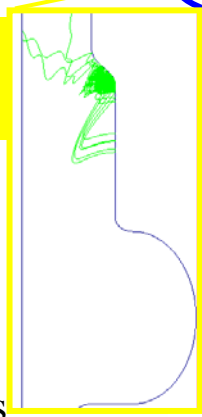


Summary of Old Ichiro 9-Cell Cavities

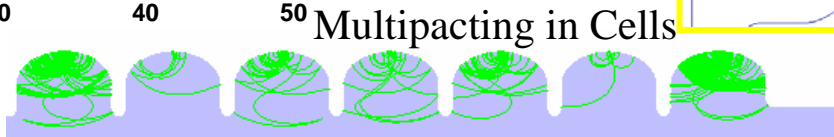
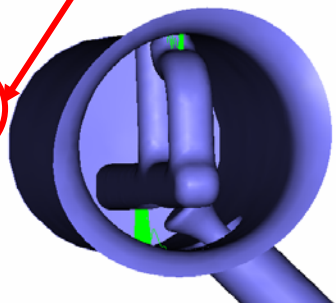
(Superstructure Version)



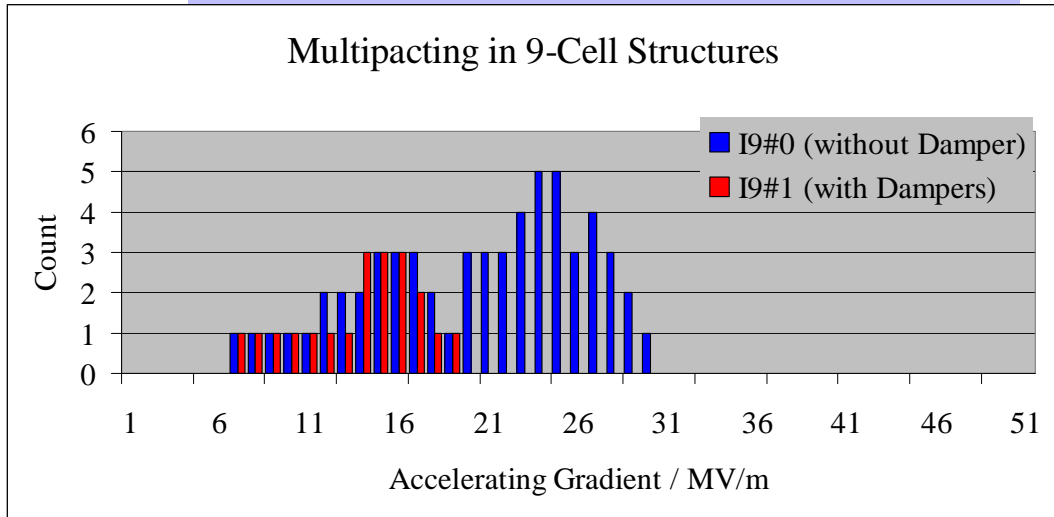
Multipacting at Tapered Beam Port



Multipacting in Dampers



Multipacting in Cells

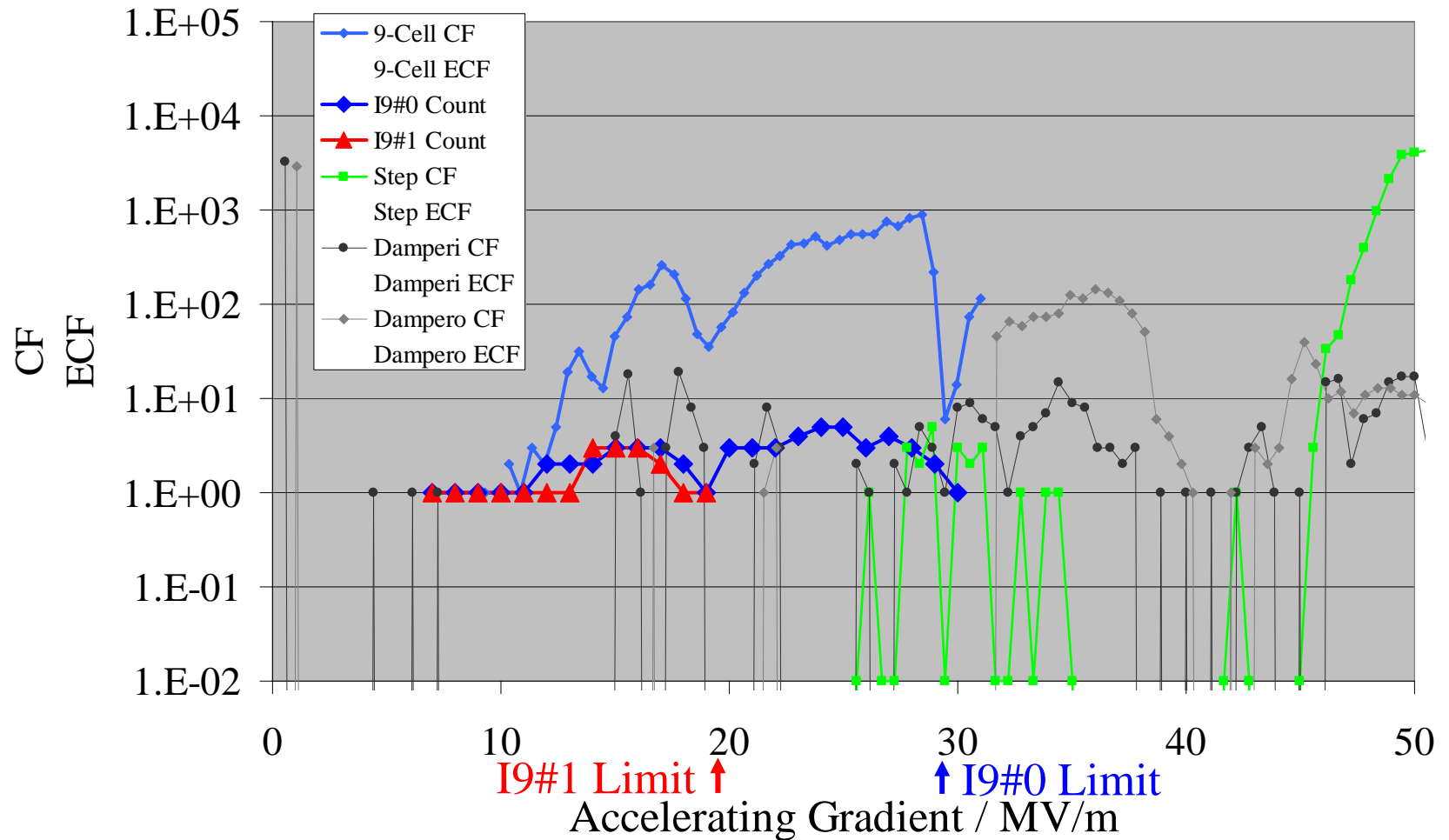


9-Cell-#1 Equipped

9-Cell-#0 Plain

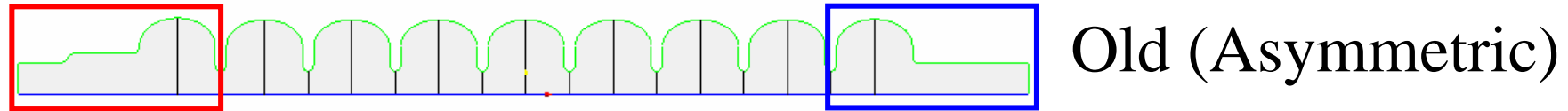
Multipacting in 9-Cell Structures

Multipacting in Old 9-Cell Structures

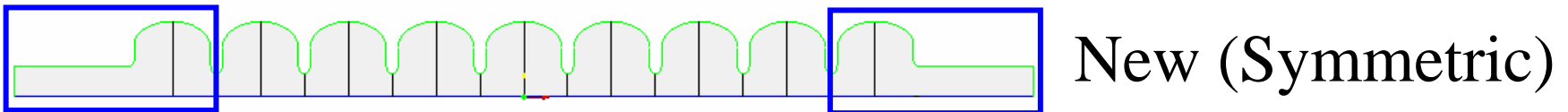


Remodeled 9-Cell Structure

Regular End Structure



Special End Structure for Superstructure Interconnect



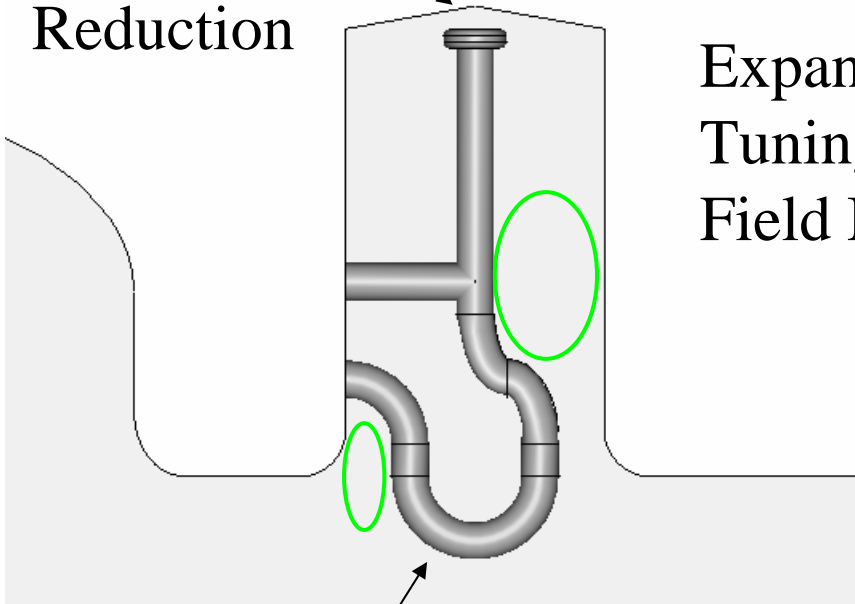
Assembling and Testing Procedures

- 1 Prepare Plain 9-Cell Structures and Full End Groups
- 2 Test them separately
- 3 Combine them into Complete 9-Cell Structures
- 4 Test them in Complete Form

New HOM Damper

- Major Features -

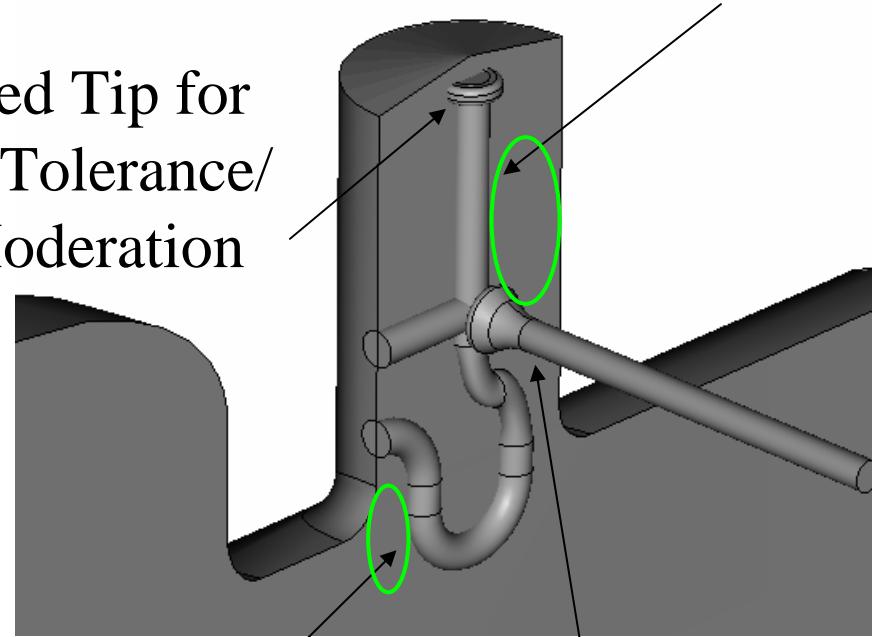
Slant Top for
Multipacting
Reduction



Simple Oval Loop

On-Center Stem for
Multipacting Suppression

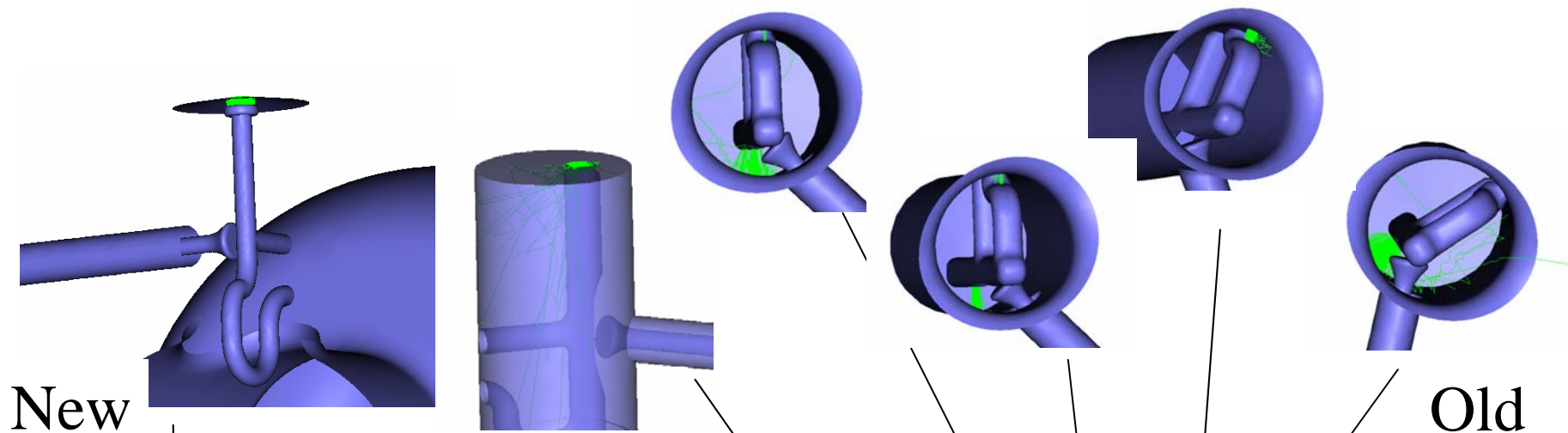
Expanded Tip for
Tuning Tolerance/
Field Moderation



Axially Oriented Loop
for Efficient Coupling

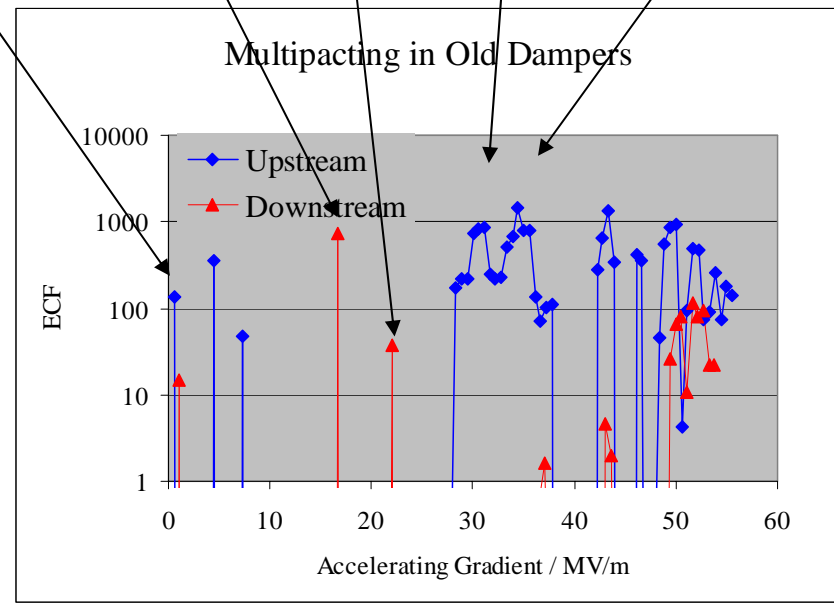
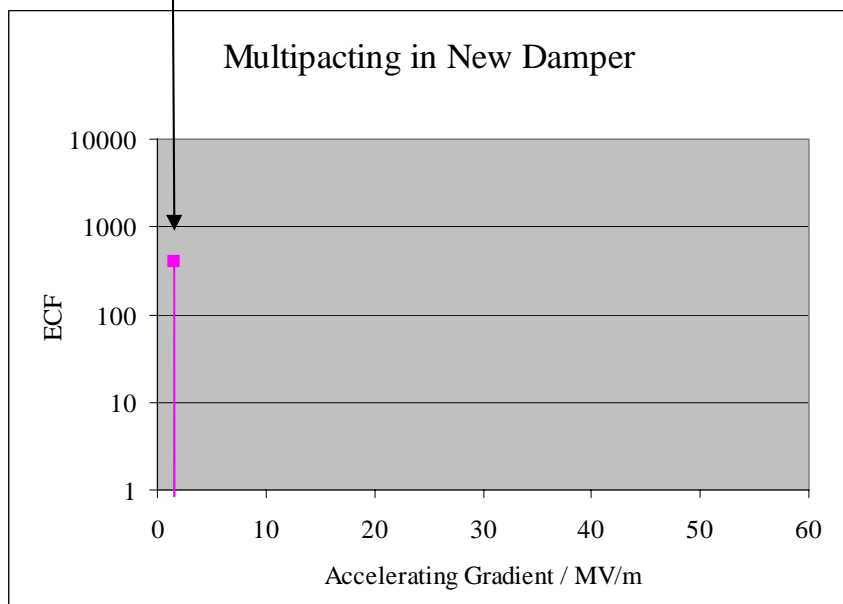
Side Extraction
for Cabling Space

Suppression of Multipacting in HOM Damper

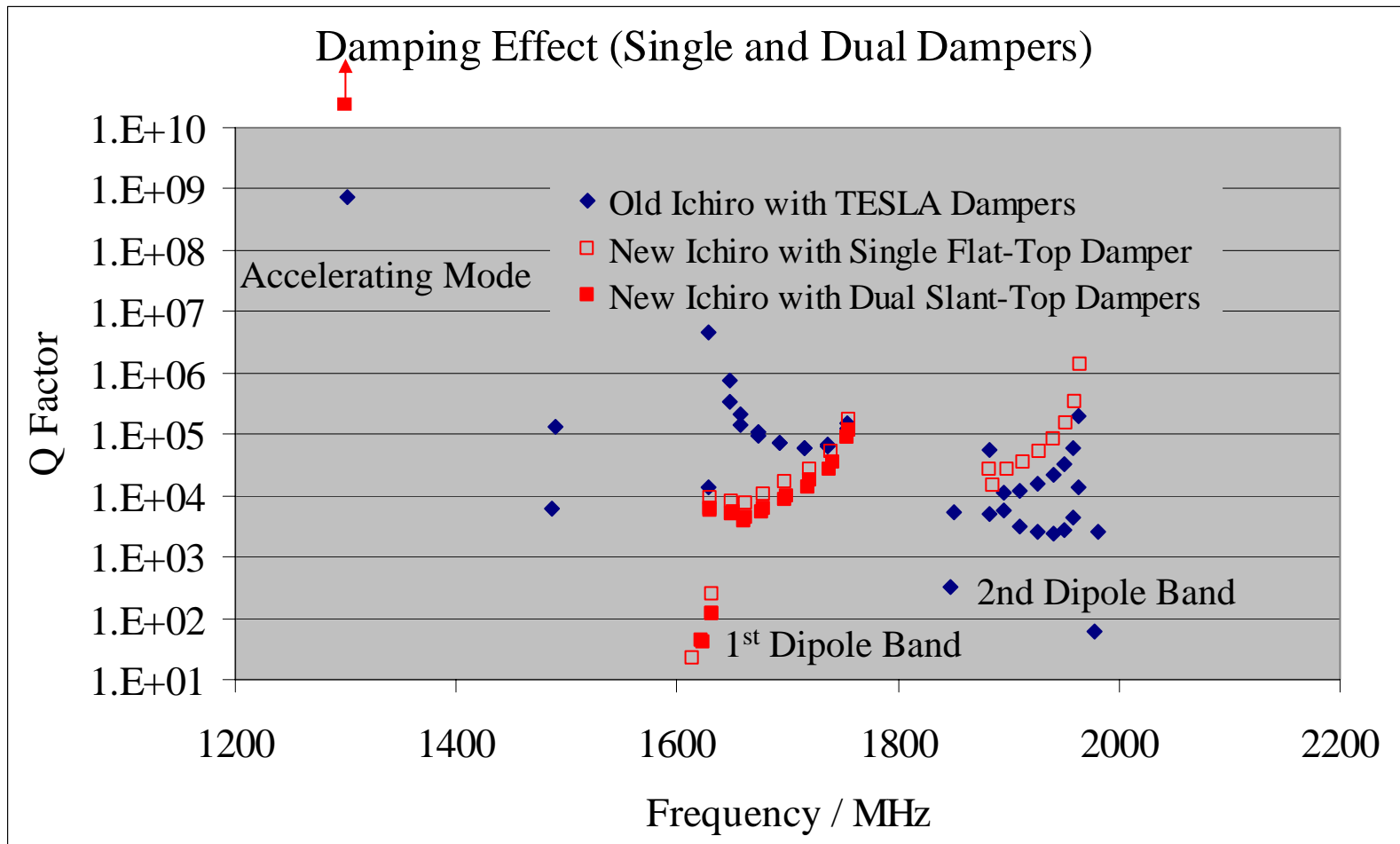
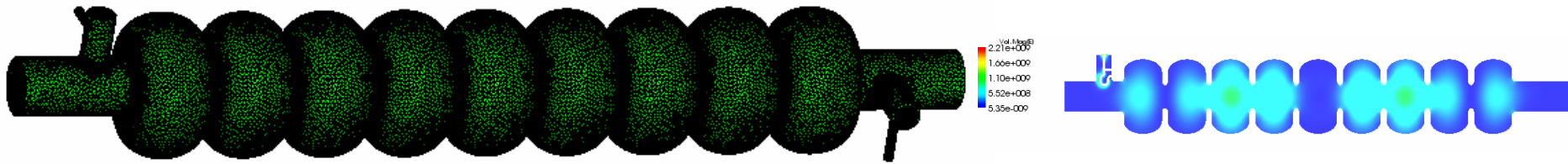


New

Old



Damping Performance



Summary of 9-Cell Structures

	Design	Feature	Eacc / MV/m	Q / 10^{10}	Status	Plan
#0	Old (Superstructure)	No Couplers	29.3	2	Remodeling	S0
#1	Old (Superstructure)		19.5	2	Installed in STF	Phase 0.5 Test
#2	Old (Superstructure)		12.4	1.2	Remodeling into Plain Struct	S0
#3	Old (Superstructure)				Testing Tuner	
#5	New				Surface Processing	Phase 1 Test
#6	New	Dumbbells from PAL			Surface Processing	Phase 1 Test
#7	New				Assembling	
#8	New				Assembling	