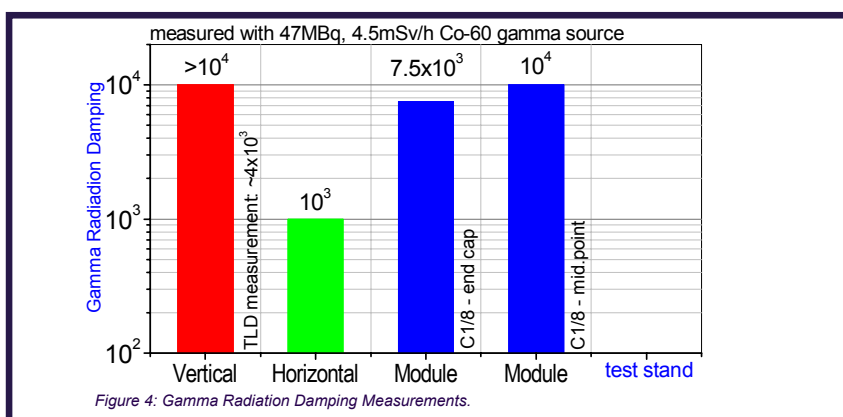
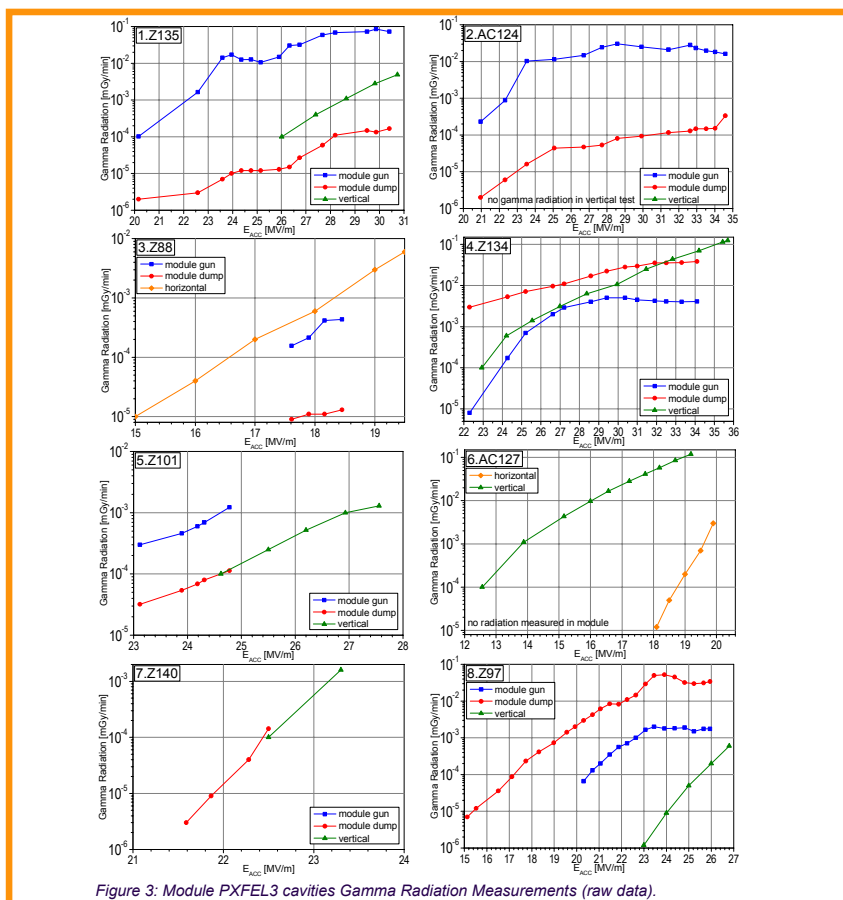
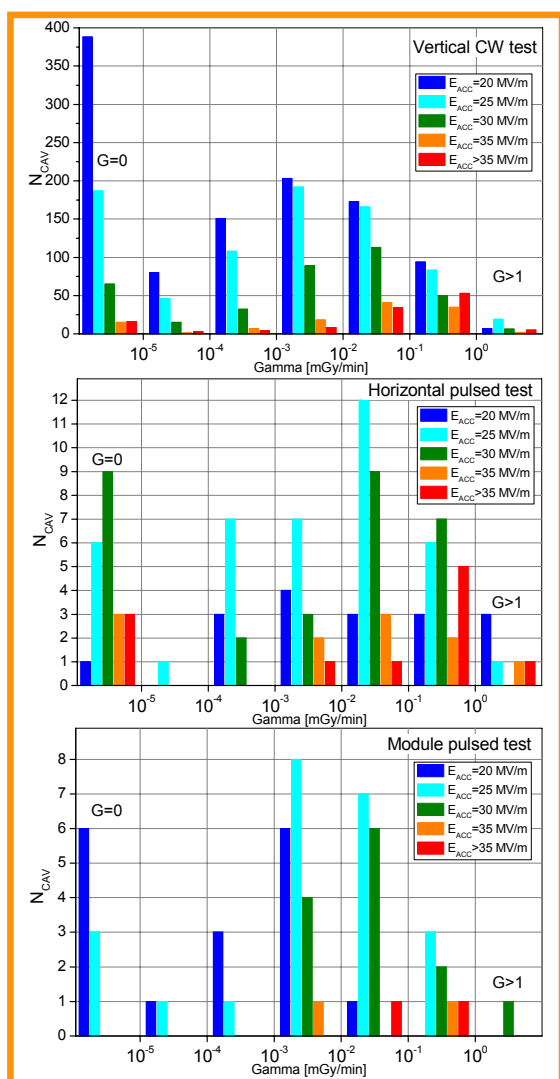
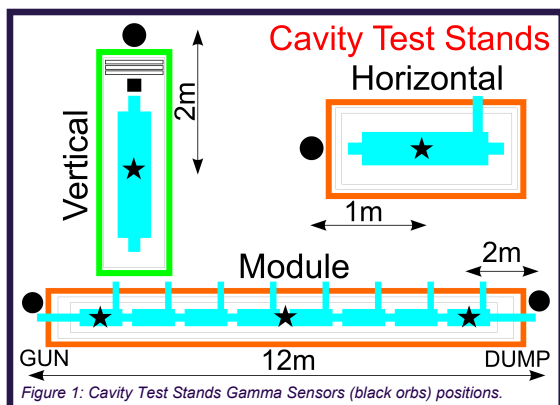


Abstract

SRF cavity Field Emission (FE) presents a major diagnostics instrument on the cavity performance, save the FE levels differ significantly from one cavity test setup to another, making the analysis difficult. A comparison study complimented with a direct calibration of FE in the cavities tested with different auxiliaries and test stands (vertical / horizontal / module) is presented and discussed.



Summary

- Cavity Field Emission (FE) caused gamma radiation was measured on three different test stands: vertical (1 cavity, CW), horizontal (1 cavity, pulsed) and module test (8 cavities, pulsed). Fig.1 shows the gamma sensors positions on the test stands.
- Pulsed (1 ms / 10 Hz) to CW integrated gradient ratio is 100, so the CW test must have 100 times higher direct on-cavity measured radiation level. PXFEL3 (Fig.3) cavities 1 and 6 give agreeable results. For direct comparison of the data the infrastructure (shielding) and cavities positions (see Fig.1) must be taken into account as well.
- Direct gamma radiation measurements with Co-60 gamma source results are presented in Fig.4, gamma source positions marked with a star in Fig.1
- Cavities test gamma radiation measurements statistics (Fig.2) shows no significant difference between the test stands, still the vertical test statistics has much more data.
- Module PXFEL3 cavities were tested together and separately after the disassembly without treatment. Measurement results acquired from module, horizontal and vertical tests (Fig.3) are mostly close. The pulse/CW ratio, infrastructure damping, cavities positions and measurements errors must be compensating each other in given measurement range and precision.
- Common FE high/low threshold can be set for all test stands, in our case 10^{-2} mGy/min.