Application Note

Black Piranha on IMS Giotto Class and Image 3DL

This application note describes how the Black Piranha measures kV on IMS Giotto Class and IMS Giotto Image 3DL.

Note that the information hereafter is valid for Black Piranha with hardware version 5.5. The information is not valid for Red Piranha or Barracuda MPD.

Introduction

Evaluation of the Black Piranha were performed at IMS Giotto on following models and units:

Giotto Class
Giotto Class, SN1612031641, (nominal) mounting angle for IAE tube 12°, filtration parallel to the tube.

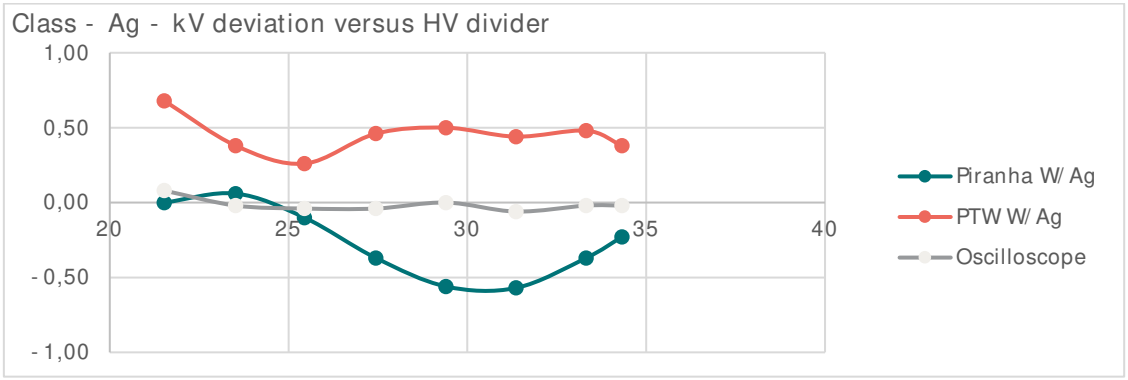
Giotto Image 3DL
Giotto Image 3DL, SN1713100424, (nominal) mounting angle for IAE tube 6°, filtration parallel to the detector.

Giotto Class – feb 2020
Giotto Class, SN30875 and 103374, (nominal) mounting angle for IAE tube 12°, filtration parallel to the tube.

Results

For the data that follows, the voltage divider read out with a Fluke DVM is considered as reference. All measurements below are valid for large focal spot, and the detector positioned in reference position on the breast support, 6 cm from chest wall.

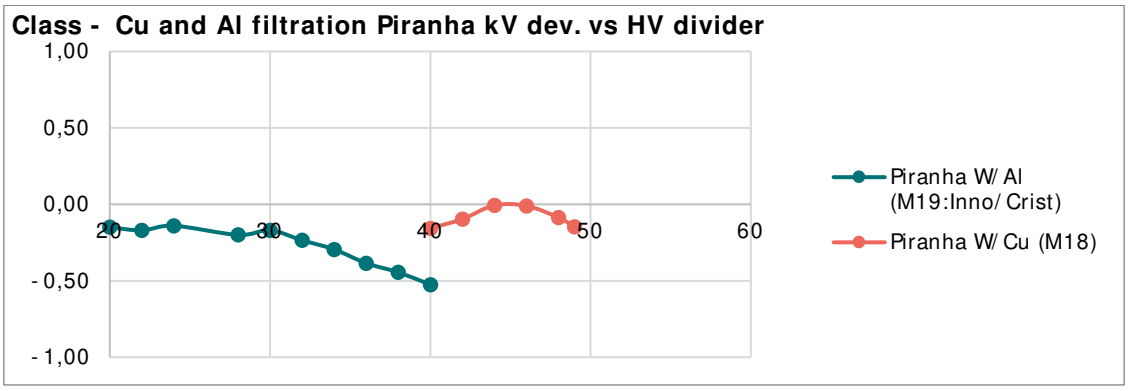
Giotto Class



The Piranha result is valid for the standard W/Ag calibration (M10).
The result show that the Piranha has a maximum deviation from the reference of -0.6 kV for the IMS Giotto Class in the range 29 to 32 kV. This is valid using the calibration M10 (W/50 µm Ag).

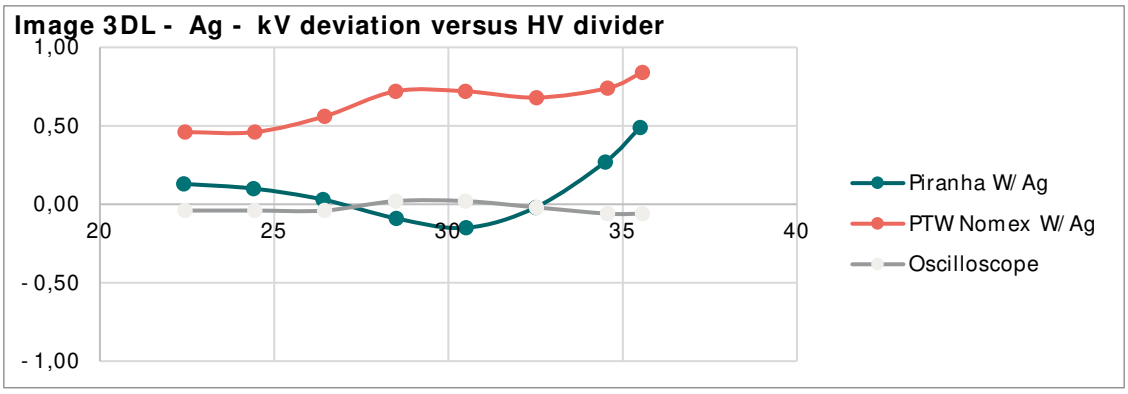
Application Note

Giotto Class – Cu and Al filtered beams

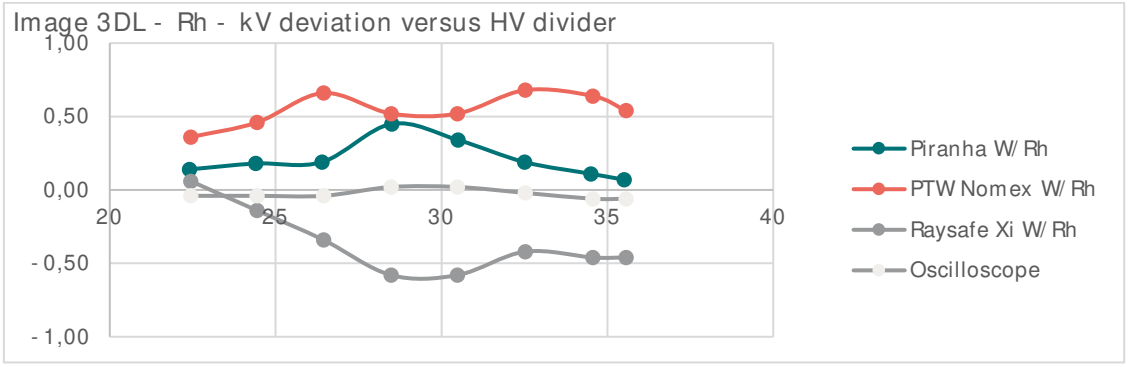


The Piranha result is valid for the W/Cu (M18) and W/Al (M19 Inno/Crist).

Giotto Image 3DL



The Piranha result is valid for the standard W/Ag calibration (M10).



The Piranha result is valid for the standard W/Rh calibration (M6).

For IMS Giotto Image 3DL the largest deviation for the Piranha is +0.5 kV at 35 kV, using calibration M6 (W/50 µm Rh).

Note:

The calibration W/50 µm Rh (Gio), (M12), shall not be used for the Class or Image 3DL, of later release dates. Use of this calibration will lead to significant over estimation of kV.

Application Note

Correction Factors for Black Piranha

The data hereunder are valid for Black Piranhas calibrated after September 1, 2015

With the Black Piranha a number of improvements have been introduced.

- The hardware has been changed to minimize position and angle dependence in mammography. It does no longer matter if the Piranha is placed with the detector area to the left or to the right.
- The internal algorithms in the calibration procedure have been improved so that deviation between every individual Piranhas are minimized.
- A range of manufacturer specific and machine specific calibrations have been introduced for even higher precision in measurements.

The graphs below show correction data for the Black Piranha with version 5.5, with calibrations after September 1, 2015. The corrections are valid to specifically match the IMS Giotto Class and Image 3DL units. Verification and validation have been done at the IMS Giotto plant in Bologna, It.

All data below shows the correction to apply for a Black Piranha. The data is valid for large focal spot.

IMS Giotto Class

W/50 µm Ag (M10)

Measured kV	Black Piranha Correction
22	+0.0 kV
24	+0.0 kV
26	+0.2 kV
28	+0.4 kV
30	+0.6 kV
32	+0.5 kV
34	+0.3 kV
35	+0.2 kV

W/Al (M19: W/Al Inno/Crist)

Measured kV	Black Piranha Correction
20	?0.1 kV
22	+0.2 kV
24	+0.1 kV
26	+0.2 kV
28	+0.2 kV
30	+0.2 kV
32	+0.2 kV
34	+0.3 kV
36	+0.4 kV
38	+0.5 kV
40	+0.5 kV

W/Cu (M18)

Measured kV	Black Piranha Correction
40	+0.2 kV
42	+0.1 kV
44	+0.0 kV
46	+0.0 kV
48	+0.1 kV
49	+0.1 kV

IMS Giotto Image 3DL

W/50 µm Ag (M10)

Measured kV	Black Piranha Correction
22	-0.1 kV
24	-0.1 kV
26	-0.0 kV
28	+0.1 kV
30	+0.2 kV
32	+0.0 kV
34	-0.2 kV
35	-0.4 kV

W/50 µm Rh (M6)

Measured kV	Black Piranha Correction
22	-0.2 kV
24	-0.2 kV
26	-0.2 kV
28	-0.4 kV
30	-0.3 kV
32	-0.2 kV
34	-0.1 kV
36	-0.1 kV