

Type Test Results of the New Instadose Dosimeter

2012 IRPA
Glasgow, Scotland
17 May 2012



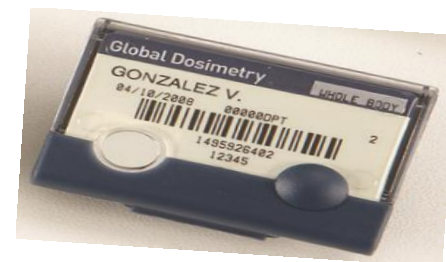
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Kip Bennett
Dosimetry Services Division



Introduction to Instadose

- Legacy Personal Passive Dosimetry platforms ultimately require a return to a centralized processor for analysis



- One of the main advantages of instadose is that it can be read on-site via a PC/Mac utilizing a web-based software package



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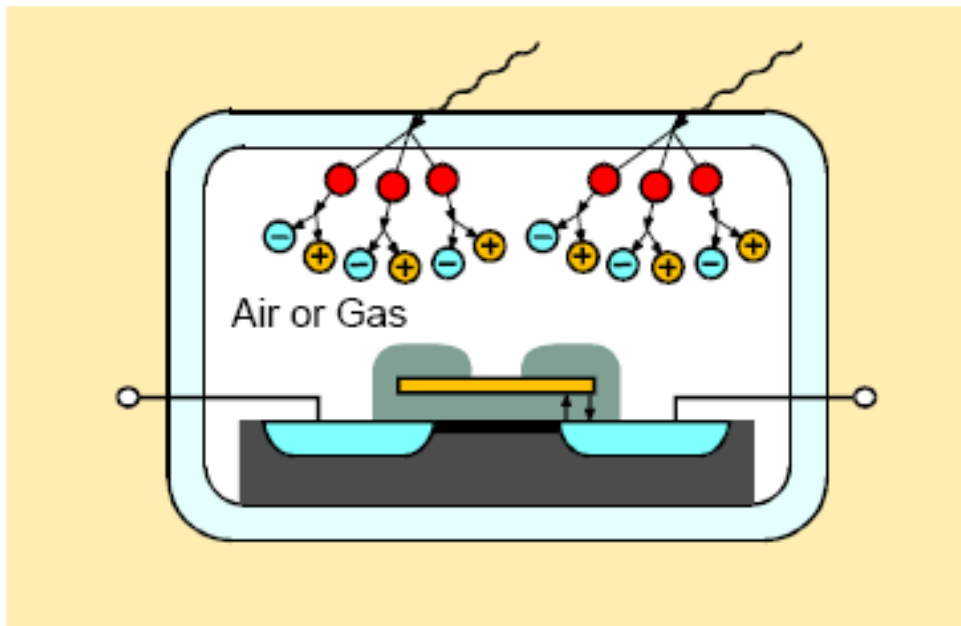


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Instadose Detector



- Instadose utilizes the DIS (Direct Ion Storage) detector
- DIS Dosimeter:
 - Non Volatile Analog Memory Cell surrounded by a Gas Filled Ion Chamber
 - For photon radiation, initial interactions take place in the wall material and secondary electrons ionize the gas of the chamber

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Limited Distribution - Internal Use Only - Proprietary



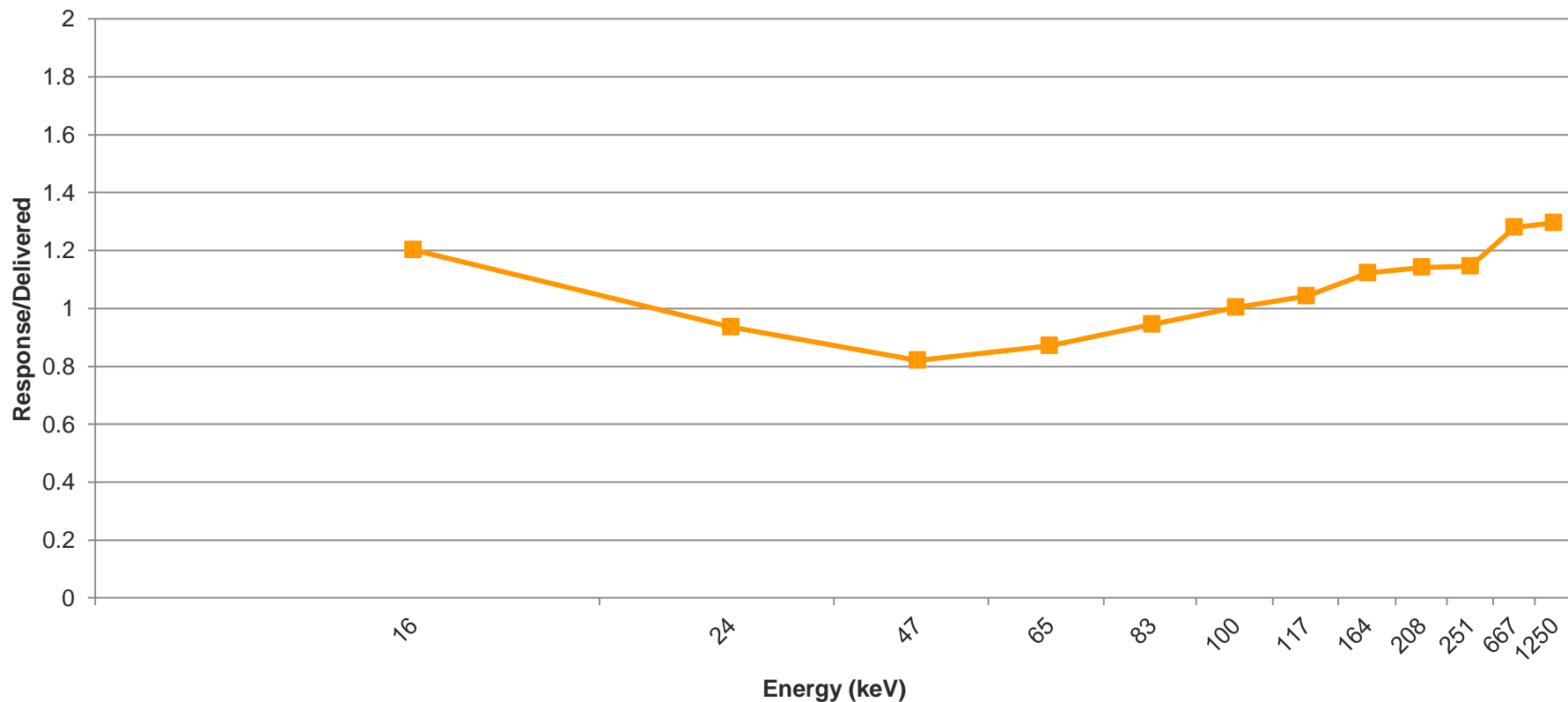
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Instadose Energy Response

Instadose Energy Response NVLAP Proficiency Blind Test , ANSI N13.11-2009



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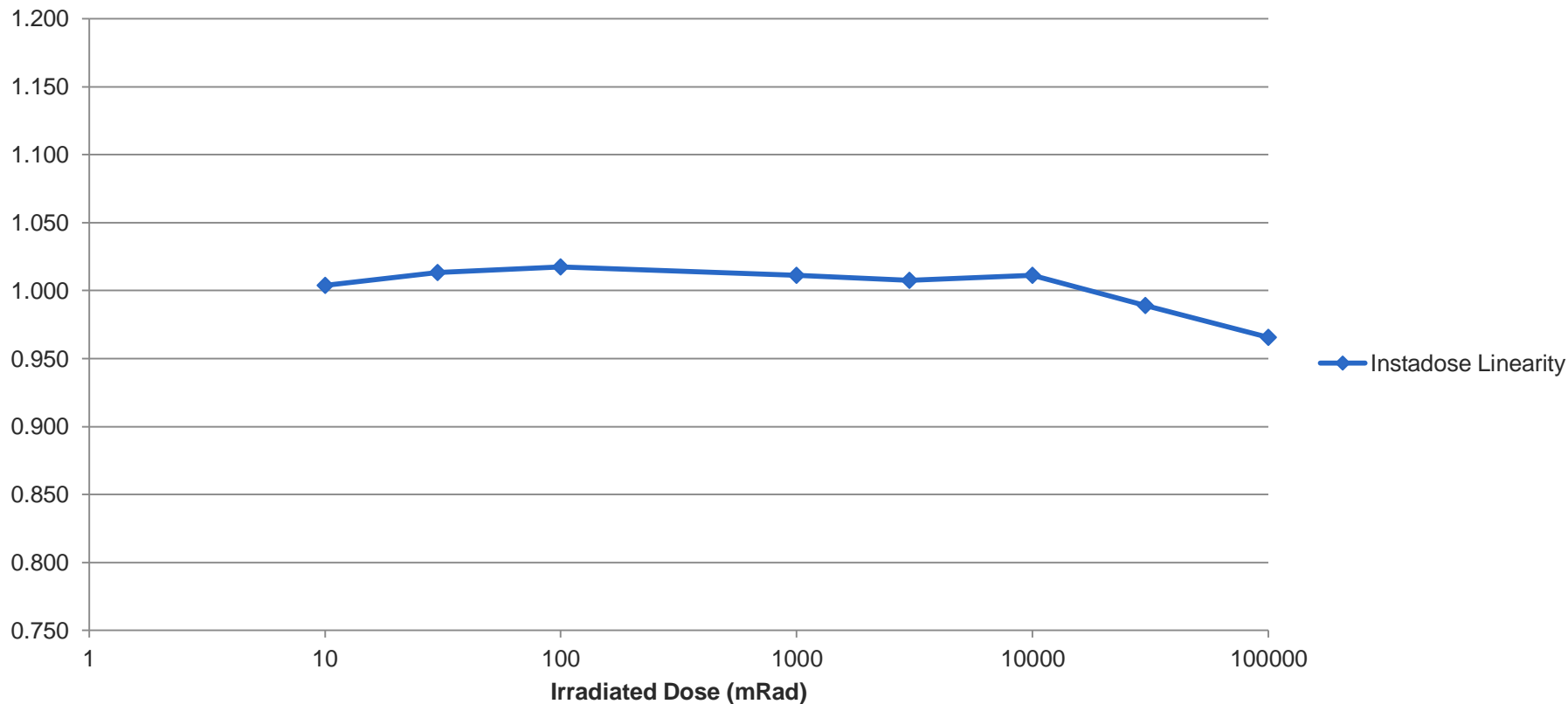
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Instadose Linearity

Instadose Linearity



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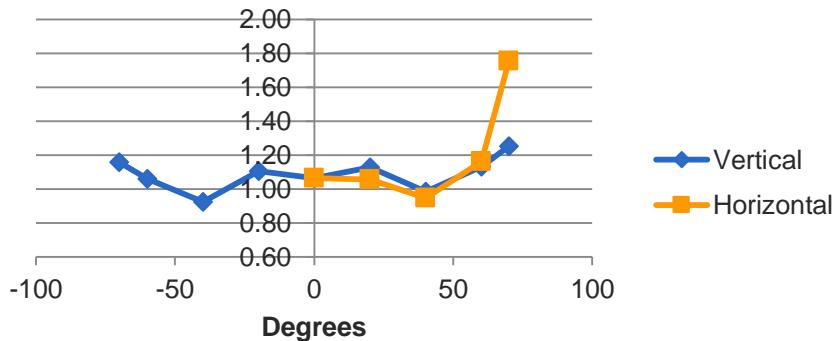
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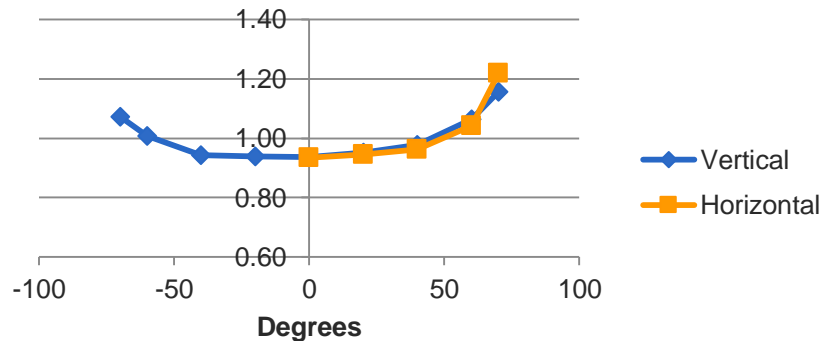


Instadose Angularity

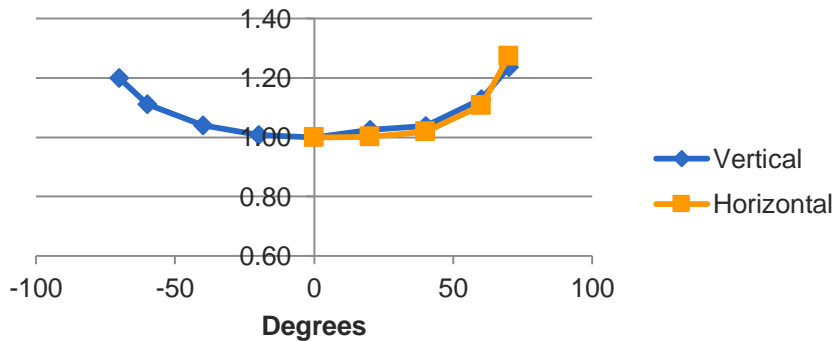
NS 30 (24 keV)



NS 60 (48 keV)



NS 80 (65 keV)



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Low Dose Testing

Irradiated Dose (mSv)	0.01	0.03	0.05	0.1	0.2	0.25
Average Dose	0.009	0.026	0.053	0.096	0.197	0.251
Standard Deviation	0.008	0.002	0.001	0.001	0.0003	0.0003
Max	0.025	0.036	0.064	0.11	0.207	0.264
Min	0.001	0.009	0.044	0.062	0.189	0.236
Median	0.009	0.026	0.053	0.1	0.196	0.251
n=10						

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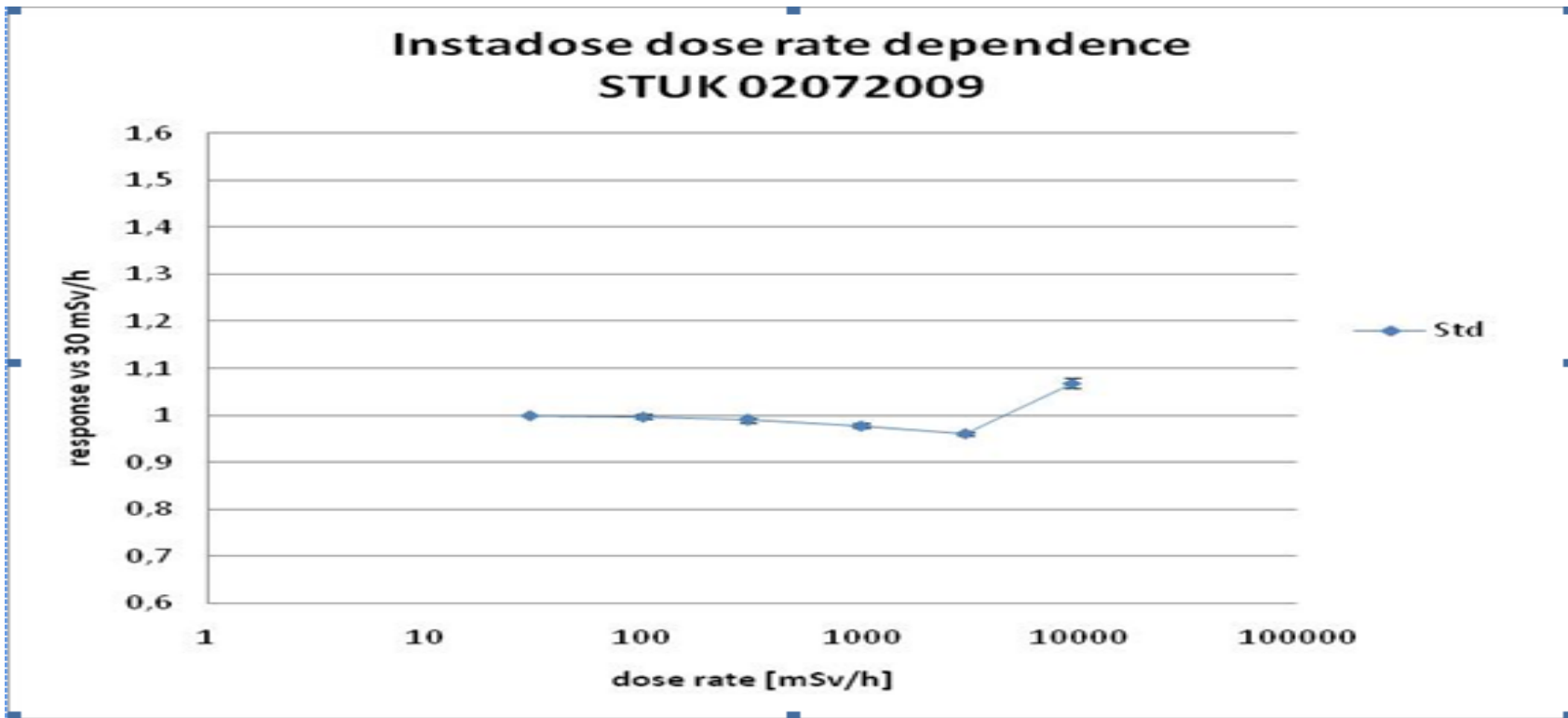
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Instadose Dose Rate Independent

- Dose Rate Independent



$$Response = \frac{Dose_{em}}{Dose_{CTV}} (dose\ rate_i) \text{ is normalized to response at } 30\ mSv\ h^{-1}$$

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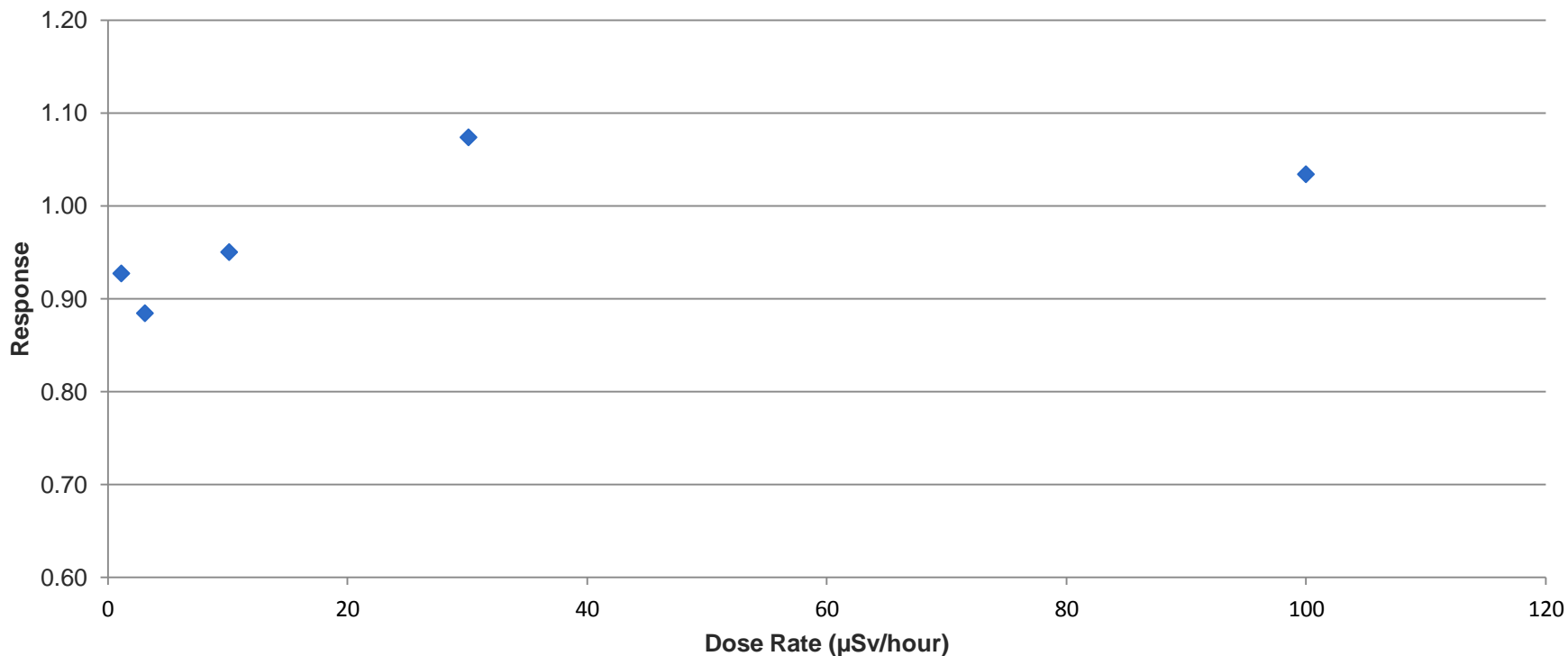
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Low Dose Rate Test Data

- 1.1 $\mu\text{Sv/hr}$ to 100 $\mu\text{Sv/hr}$ (courtesy of ARS)

Low Dose Rate Test



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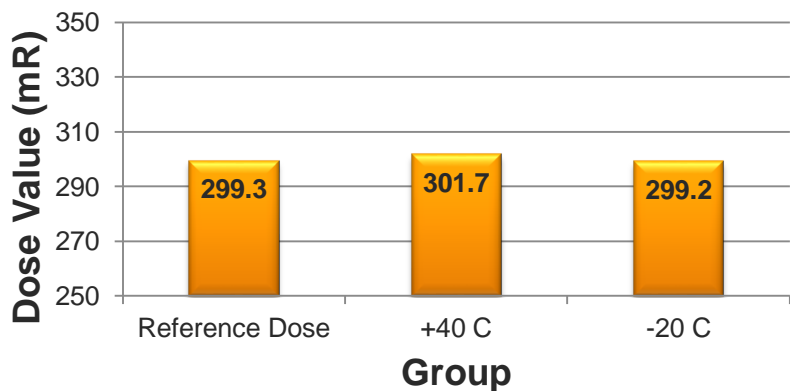
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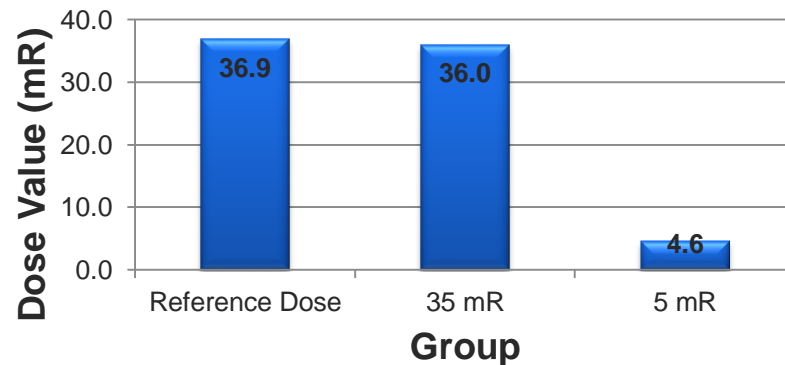
Temperature Testing

- Two tests
- Test 1 - 3 Groups (reference, +40C, -20C) were irradiated to 3.0 mSv
- Test 2 – 2 Groups (0.35 mSv and 0.05 mSv) at +40C

Instadose Temperature Test



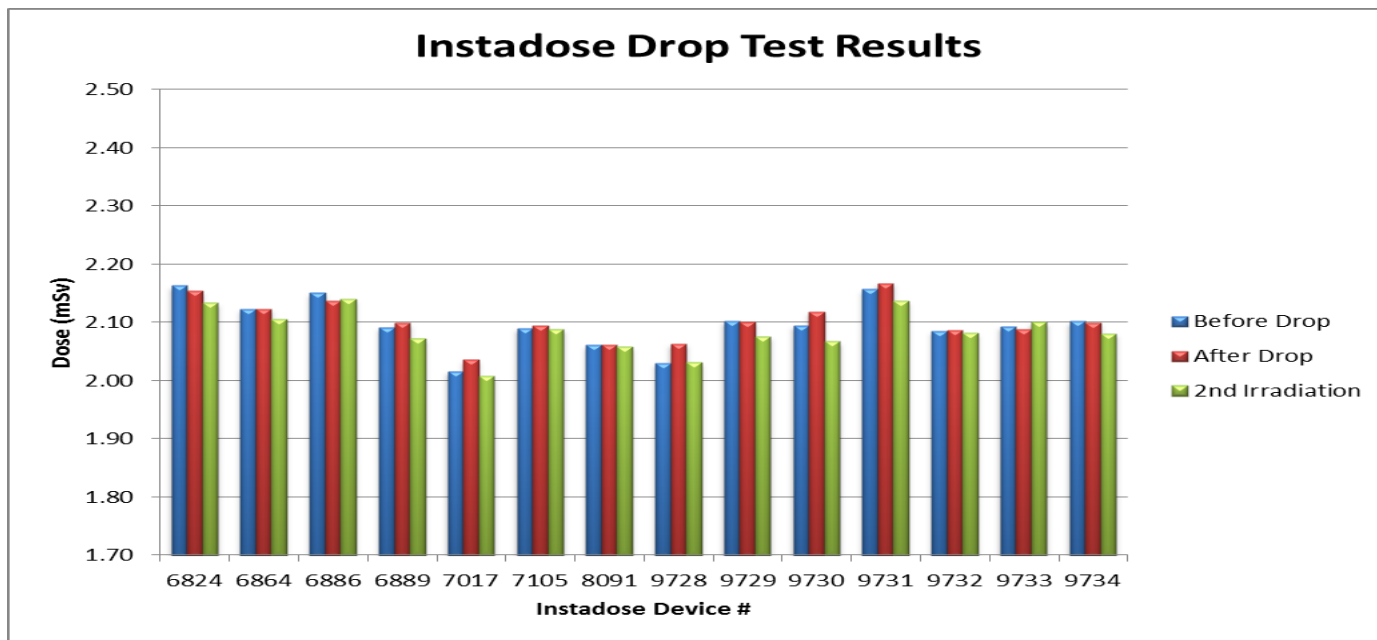
Instadose Low Dose Temperature Test





Drop Test

- Instadose were irradiated to 2.0 mSv
- Read
- Dropped at 1 m
- Re-read
- Re-irradiated to 2.0 mSv



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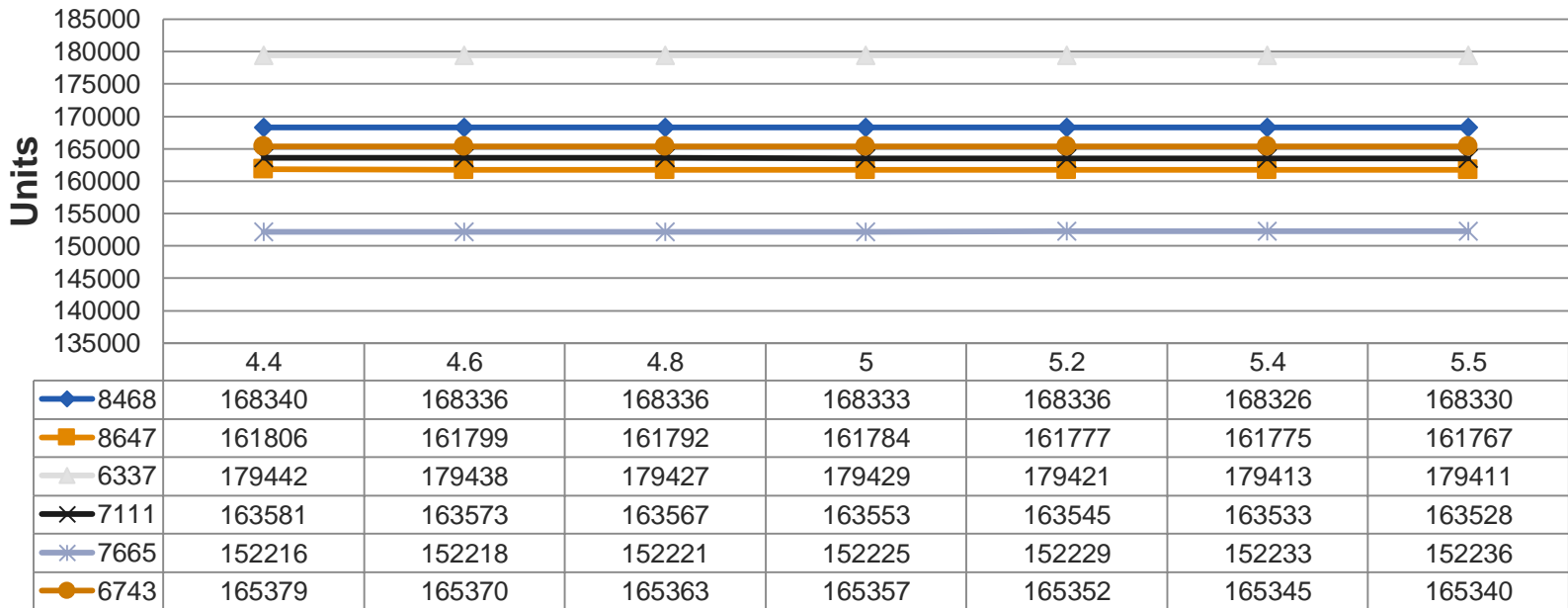
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PC USB Power

- Power from a PC's USB may vary
- Test to determine if varies, will dose still be good.
- 6 devices irradiated to 3.0 mSv and read at various voltages

PC USB Voltage Test



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Summary

- The instadose dosimeter performed very well in the testing performed
- The instadose dosimeter created a paradigm shift to standard personal passive dosimetry



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