

## **Filamentation due to the Vacuum-to-Air Window of the X-ray Pinhole Camera**

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X-ray pinhole cameras are still the preferred option for emittance measurement in synchrotron light sources due to their simplicity in design, operation and data analysis. It has been observed over many years at multiple facilities, that a structure similar to a diffraction pattern is observed when the electron beam size is squeezed. This effect is called filamentation and has been identified to come from the vacuum-to-air window of the pinhole camera. It is problematic due to its interference with beam size measurements, particularly when operating close to the resolution limit of the pinhole camera. Given that the brilliance and coherence will increase in 4th generation synchrotrons, such as Diamond-II, from the reduction in beam emittance, it is important we minimise this filamentation effect to ensure accurate beam size measurements are available. Here we report on recent measurements in preparation for Diamond-II.

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