High Flux X-ray Beam Delivery System

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We are developing a revolutionary, new type of high flux x-ray beam delivery system based on a super bright laboratory source that is designed to be more than 10X brighter than the brightest rotating anode x-ray source currently available. It will also offer a substantially wider selection of characteristic x-ray energies than are available using the current x-ray source technologies. The outstanding performance of the x-ray source is achieved with patent pending x-ray source technology that incorporates the outstanding thermal and material properties of diamond as a part of the microstructured anode, creates large thermal gradients within the microstructure, and incorporates an optimized electron energy deposition profile. The source is also designed to accumulate x-rays generated from a linear array of x-ray sub-sources. In addition, it uses axially symmetric x-ray reflection optic with a large solid angle of collection from the source and customer selectable beam collimation profile.

The high flux x-ray beam delivery system represents an important innovation in x-ray beam delivery technology and is designed to provide more than 10X higher x-ray flux than the most advanced similar systems currently available. Its performance will enable substantial performance improvement in a wide range of x-ray analysis techniques, such as micro x-ray fluorescence (uXRF), x-ray diffraction (XRD), small angle x-ray scattering (SAXS), and total x-ray reflection fluorescence (TXRF). The design and expected performance will be presented.