Angular Distributions of Bremsstrahlung Photons Emission From ECR Plasma

M.J. Kumwenda, J.K Ahn, J.W Lee, I.J Lugendo, B. Hong

Korea University

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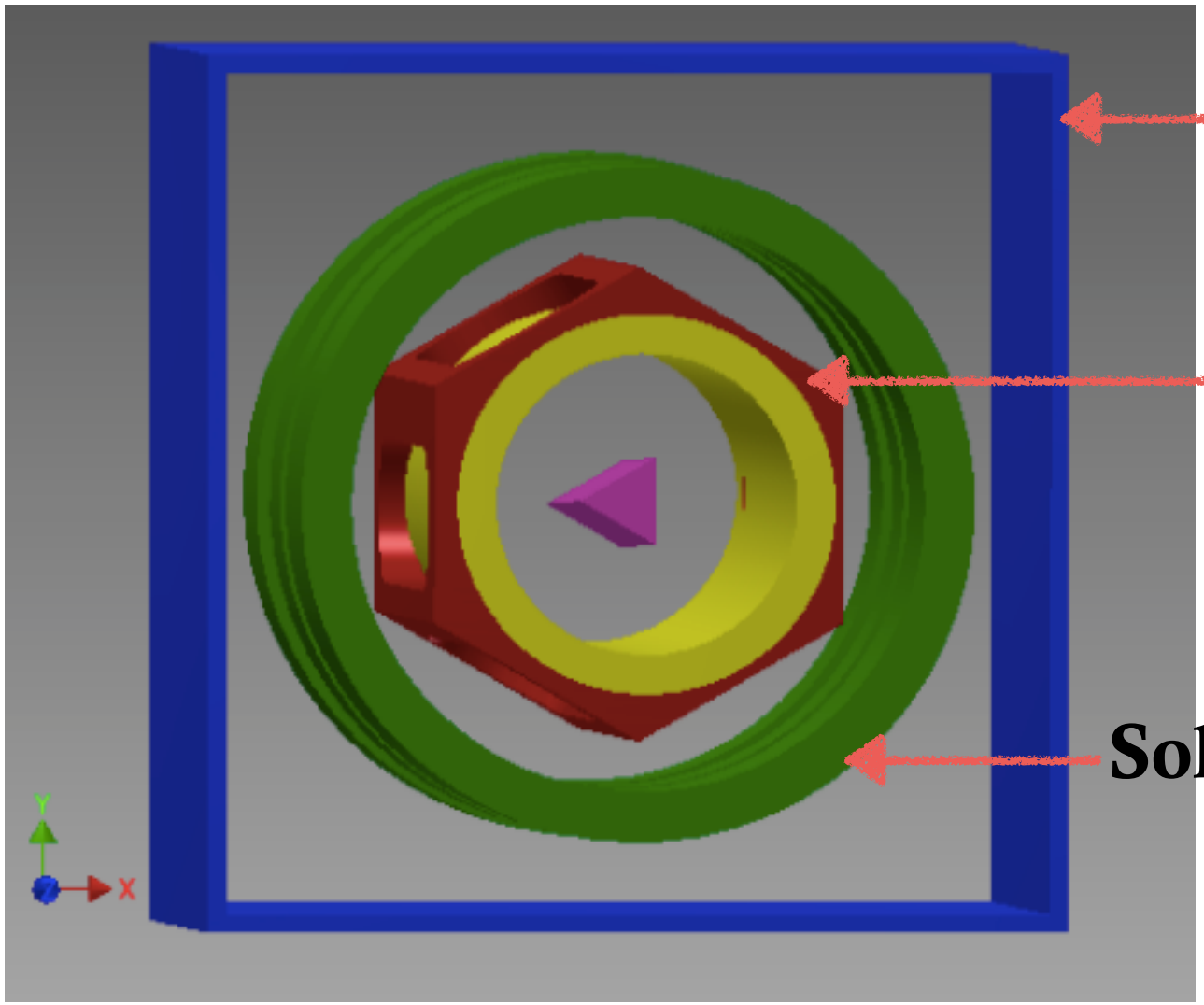
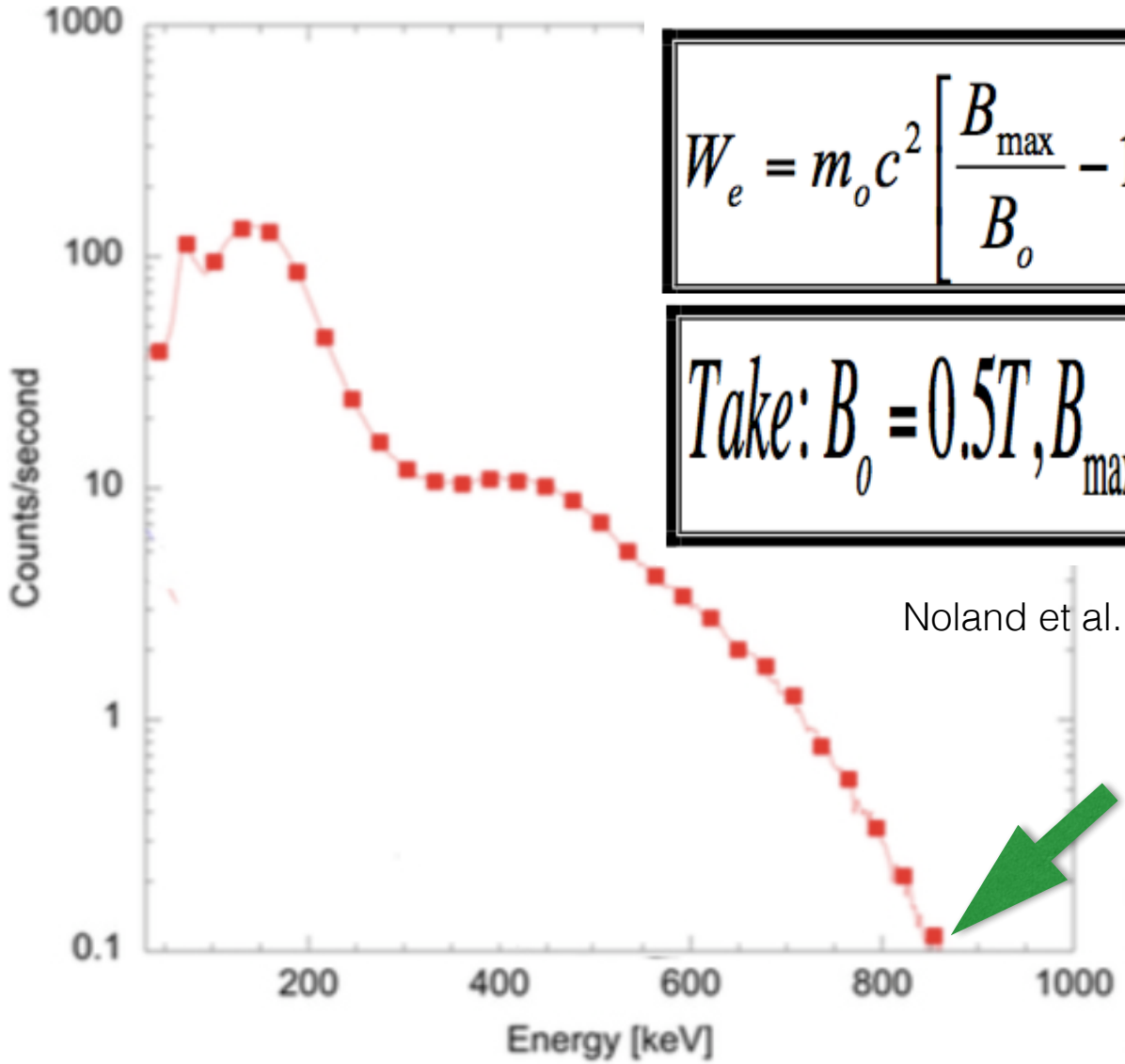
Introduction



- The plasma is heated resonantly with microwaves

Theoretical Interpretation



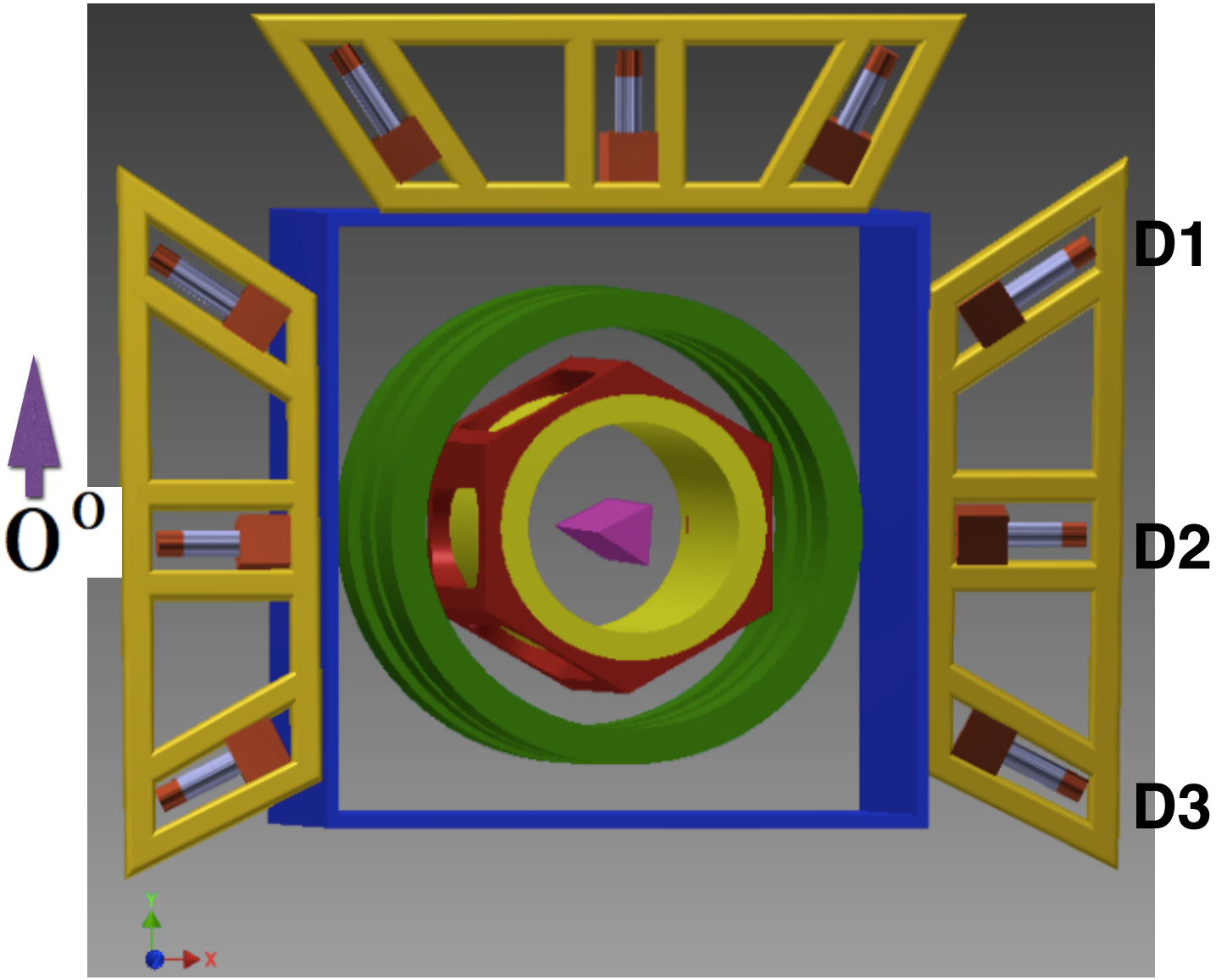
$$W_e = m_o c^2 \left[\frac{B_{\max}}{B_o} - 1 \right] = 0.511 \left[\frac{B_{\max}}{B_o} - 1 \right] MeV$$

$$Take: B_o = 0.5T, B_{\max} = 1.2T \Rightarrow W_e = 0.715 MeV$$

Noland et al.,Rev.Sci.Intrum.81,02A308 (2010)

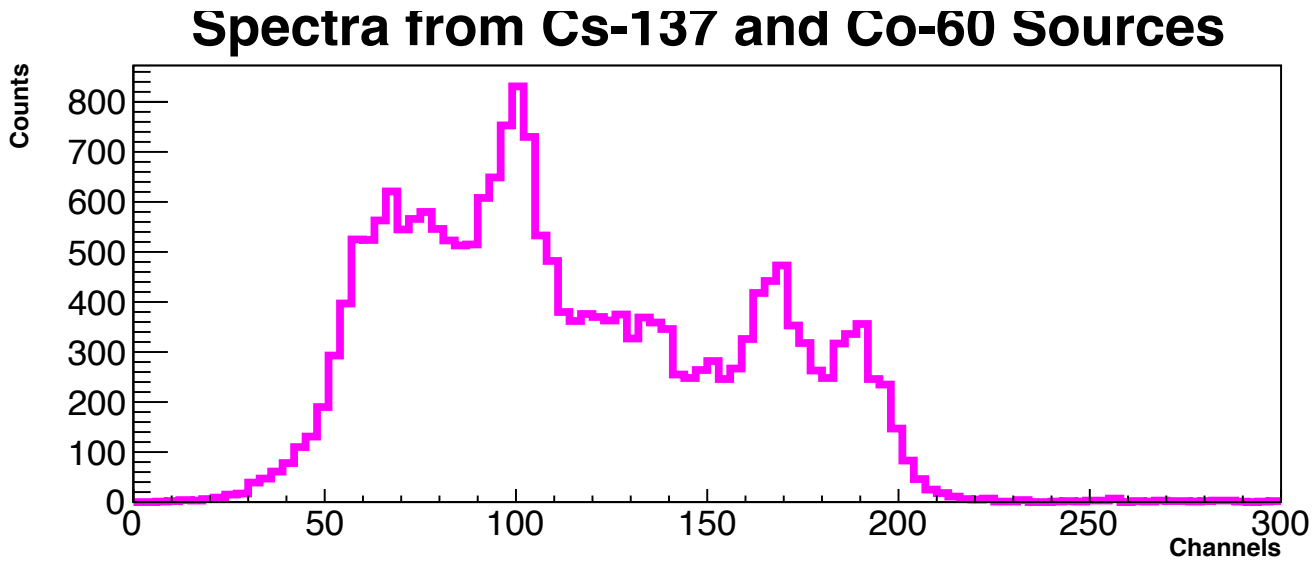
- **No proper explanation about the nature of high energy component from ECR plasma.**

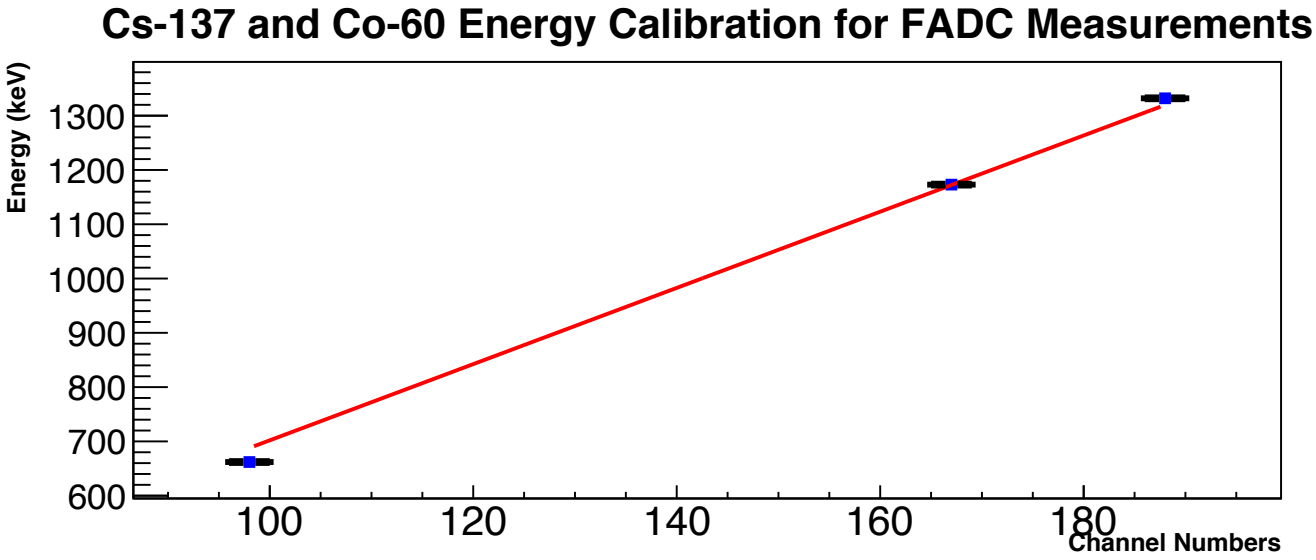
Experimental Setup (Schematic View)



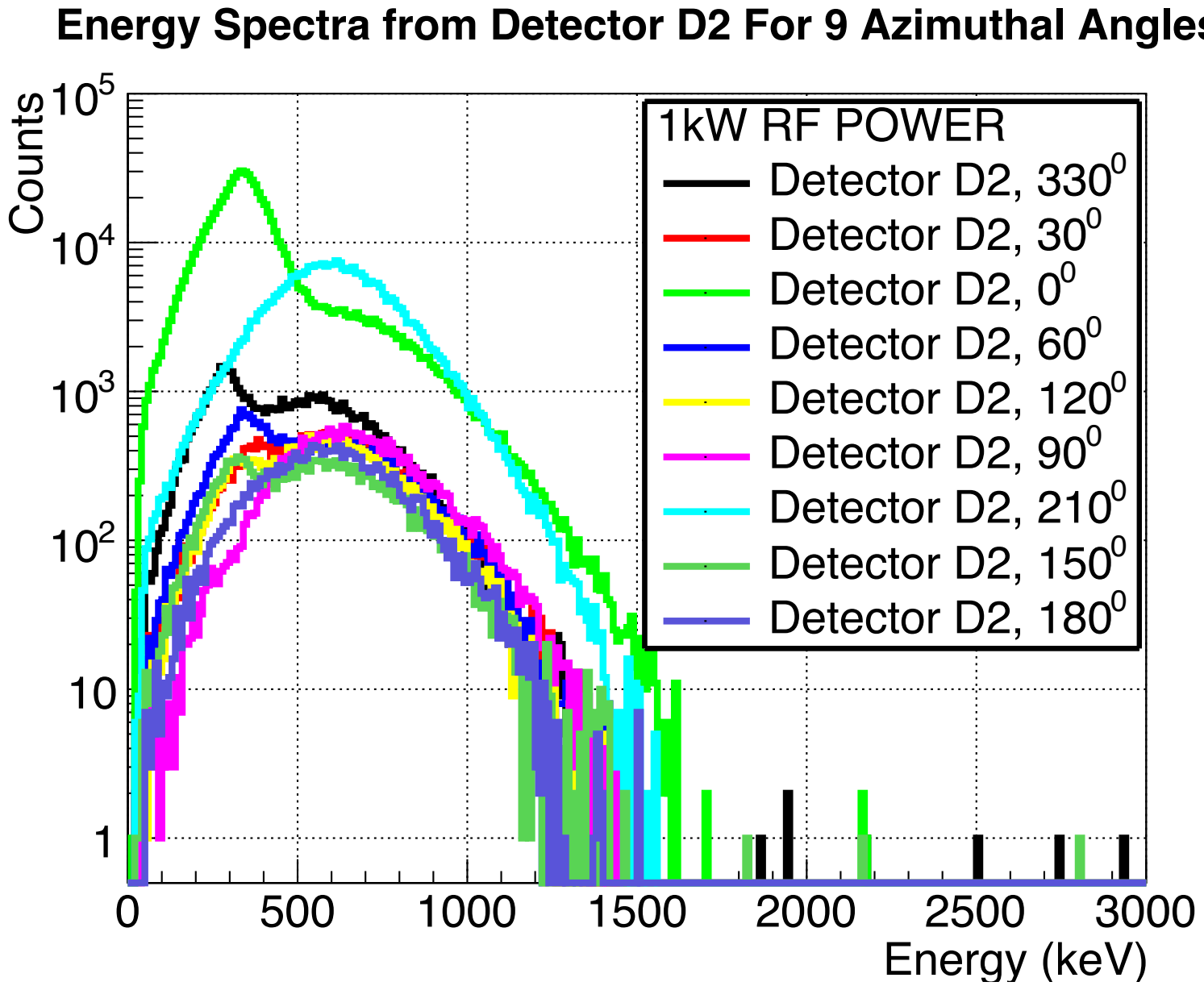
- Schematic view of the (NaI(TI)) detectors geometry

Energy Calibrations





Energy Spectra of Bremsstrahlung Photons



Uncorrected Angular Distributions Results

Detection Efficiency From Geant4 Simulation

Corrected Angular Distributions Results

Remarks

- **The system of three round type NaI(TI) detectors has been used to study the angular distributions of bremsstrahlung photons emission from ECR plasma.**
- **Preliminary results from this study shows *some modulation*.**
- **Therefore the X-ray emission from plasma chamber of ECR ion source is not uniform and is angular dependence.**