**1. ECE Radiometer**

- The spectrum of the Electron Cyclotron Emission (ECE) from HSX is measured with an eight channel radiometer at a magnetic field of 0.5 T.
- The central region of the plasma is not accessible because the plasma is heated by the extraordinary wave at the second harmonic.
- A low-pass filter with 60 dB attenuation in the band of 150-300 GHz reduces pickup from the heating source at its second harmonic.

**2. Calibration**

- Calibration has been made for two sets of eight IF filters — one set for receiving the electron cyclotron emission from the low magnetic field side and the other one — from the high magnetic field side.
- The phase difference between ECE signals on the either side of the magnetic axis is about 90 degrees.
- The integrated response has been calculated assuming that the plasma is a black body. These calculations are used to estimate the plasma density.

**3. Results of measurements**

- ECE channels have been calibrated against the electron temperature measured by Thomson scattering (TS) diagnostic in the plasma with off-axis heating.
- The spectrum of the Electron Cyclotron Emission (ECE) from HSX is measured with an eight channel radiometer at a magnetic field of 0.5 T.
- The central region of the plasma is not accessible because the plasma is heated by the extraordinary wave at the second harmonic.
- A low-pass filter with 60 dB attenuation in the band of 150-300 GHz reduces pickup from the heating source at its second harmonic.

**4. Bi-Maxwellian plasma model**

**5. CQL3D code**

*CQL3D code is used to simulate the electron cyclotron heating in QHS and to calculate a radiation intensity at the second harmonic of Vece.*

*On the left figures the results of two runs are shown.*

*The plasma parameters are as follows: central T_e = 0.4 keV, central N_e = 10^{18} m^{-3} and input power is 100 kW.*

*On the left bottom figure it is clearly seen that the ECE temperature for the non-Maxwellian electron distribution function is above 4 keV.*

*Further work should be done to understand why CQL3D predicts low ECH absorption in HSX plasma.*

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*On the right figures the results of two runs are shown.*

*The plasma parameters are as follows: central T_e = 0.4 keV, central N_e = 10^{18} m^{-3} and input power is 100 kW.*

*On the left bottom figure it is clearly seen that the ECE temperature for the non-Maxwellian electron distribution function is above 4 keV.*

*Further work should be done to understand why CQL3D predicts low ECH absorption in HSX plasma.*

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**4.1 QHS Spectrum**

**4.2 Mirror Spectrum**

**5.1 Maxwellian Electron Distribution Function**

**5.2 Non-Maxwellian Distribution Function**

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