Poster Contributions: Disks Structure and Emission

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ON THE ACCRETION DISK MODELS WITH STATIONARY AND NON-STATIONARY SHOCK WAVES

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An important point which emerged from this meeting is that disks in AGNs are not simply thin, Keplerian type; they show more complex behaviour. Chakrabarti (1990a and references therein) has shown that in an inviscid accretion disk with significant angular momentum, the centrifugal barrier is strong enough to produce axisymmetric standing shock wave. Subsequently, this work was extended to include the non-axisymmetric and viscous disks (Chakrabarti, 1990b). Particularly important are the solutions with viscosity, as they show that as the viscosity is increased, the stable becomes weaker and weaker till it disappears completely. This solution has a unifying character that inviscid *pressure driven* disks have almost constant angular momentum and can have shock discontinuities, but *viscous driven* disks dissipate angular momentum quick enough not to have centrifugal barrier and therefore no shock waves. Chakrabarti & Molteni (1993), using Smoothed Particle Hydrodynamics have shown that shocks are produced in inviscid disks, exactly where they are predicted.

Unlike a Keplerian disk, a disk with a shock has basically two temperature zones. The post shock solution is responsible for the Big Blue Bump and UV excess (Chakrabarti and Wiita, 1992). At the shock location, the disk is 'bulged'; the hard radiation from this region is intercepted by the cooler pre-shock flow. The shock strength and location are sensitive to input specific energy of the flow. This configuration might be responsible for the 'zero-lag' correlated variability of, say, NGC 5548 (Chakrabarti, Haardt, Maraschi & Molendi, AA, submitted) discussed in this meeting. Spiral shocks which may be produced in disks in a binary system can also appear in disks around AGNs; the perturbation may be due to passage of massive objects (Chakrabarti & Wiita, 1993a). They also cause time variations in the double horned pattern from disk line emission (Chakrabarti & Wiita 1993b) as observed in, say ARP 102B. All these observations point that shocks are probably important ingredients in any accretion disk in AGNs

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