NUCLEAR DISKS EMBEDDED IN ELLIPTICAL GALAXIES

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The Hubble Space Telescope has discovered a number of ellipticals and S0's with small nuclear, *stellar* disks (eg. van den Bosch et al. 1994, AJ, 108, 1579). The kinematics of these disks may allow a derivation of the central mass density of the host galaxy, in much the same way as is possible with ionized gas disks (e.g. M87; Harms et al. 1994, ApJ, 435, L35). In order to understand the kinematic signatures of these disks, we have constructed two-integral, axisymmetric models of ellipticals with nuclear stellar disks. We use the method developed by Hunter & Qian (1993, MNRAS, 262, 401) to calculate $f(E, L_z)$, from which we derive the velocity profiles (VPs). Depending on the choice of the odd part of the DF, one can construct a large variety of models including some with counter-rotating cores.

The main kinematic signature of a nuclear disk is a strong central decrease of the velocity dispersion (a disk is dynamically cold). The VPs clearly reveal a broad, mildly rotating component, and a narrow, rapidly rotating component. Seeing has important effects on the observables of the nuclear disks. When the seeing FWHM exceeds $2-3$ horizontal disk-scalelengths, the measured rotation curve becomes dominated by the light of the elliptical. The only signature of the nuclear disk that remains is a central *increase* in velocity dispersion, due to seeing convolution of the disk's rotation curve. Although such an increase could be interpreted as evidence for a nuclear black hole, the increase of σ_0 is rather small, not exceeding 10%. Counter-rotating, nuclear disks can explain the observed counter-rotation in a number of galaxies that have central disky isophotes. However, the counter-rotation is only visible when the disk light contributes significantly to the central VP's. In those cases a central *decrease* in velocity dispersion will be observed. Surprisingly, in most cases where counter-rotation is detected, one finds an additional strong, central *increase* in velocity dispersion. Although this might indicate the presence of a central black hole, further dynamical modelling is required to confirm this.