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Gravitomagnetic acceleration of accretion disk matter to polar jets JOHN POIRIER, GRANT MATHEWS, University of Notre Dame — The motion of the masses of an accretion disk around a black hole creates a general relativistic, gravitomagnetic field (GEM) from the moving matter (be it charged or uncharged) of the accretion disk. This GEM field accelerates moving masses (neutral or charged) near the accretion disk vertically upward and away from the disk, and then inward toward the axis of the disk. As the accelerated material nears the axis with approximately vertical angles, a frame dragging effect contributes to the formation of narrow jets emanating from the poles. This GEM effect is numerically evaluated in the first post Newtonian (1PN) approximation from observable quantities like the mass and velocity of the disk. This GEM force is linear in the total mass of the accretion disk matter and quadratic in the velocity of matter near to the disk with approximately the same velocity. Since these masses and velocities can be quite high in astrophysical contexts, the GEM force, which in other contexts is weak, is quite significant. This GEM effect is compared to the ordinary electromagnetic effects applied to this problem in the past..

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