

The Dynamics and Radiative Properties of Clouds in Magnetized Accretion Disk Outflows in AGNs

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Abstract. We have embarked on a general analysis of multi-component outflows from magnetized accretion disks in AGNs. In this scenario, dense diamagnetic clouds are embedded in a centrifugally driven wind and are uplifted from the disk surface by the dynamical drag of the wind as well as by the “melon seed” magnetic pressure gradient force. We follow the motion of the clouds above the disc surface, taking account of the radiation pressure force exerted by the central continuum for different spectral energy distributions and emission patterns. We study the evolution of the clouds as they accelerate through the wind, considering possible sources of confinement and estimating the cloud lifetimes against various disruptive processes. We then examine the spectral signatures of accelerated clouds in the context of this dynamical scheme and compute absorption line profiles as a function of viewing angle through the wind. We apply our results to the interpretation of the observed optical/UV spectra from BALQSOs and of the broad EUV and X-ray absorption features detected in a number of BL Lac objects, as well as to other AGNs in which radiative acceleration of clouds has been inferred (e.g., “warm absorbers”).