Chiral electron-vortex beams, carrying a well-defined orbital angular momentum (OAM) about the propagation axis, are potentially useful as probes of magnetic and other chiral materials. In particular, it has been proven that, unlike the optical vortex beams, electron vortex beams can directly induce dipole transitions between states normally assessable only with circular polarised light absorption. This has lead to the expectation that electron vortex beams can be used to acquire chiral dichroism spectroscopy which will be particular useful for characterization of magnetic materials. Experimentally, the situation is confusing despite initial result [2,3]. To understand this, we present a theory [4] based on an effective operator, expressible in a multi-polar form, describing the inelastic processes in which electron-vortex beams interact with atoms, including those present in Bose-Einstein condensates, involving exchange of OAM. We show clearly that the key properties of the processes are dependent on the dynamical state and location of the atoms involved as well as the vortex-beam characteristics. The later is due to the extrinsic nature of the orbital angular momentum and distinguish chiral electron energy vortex beam energy loss spectroscopy from circular magnetic dichroic spectroscopy. Our results can be used to identify optimal experimental schemes in which chiral-specific electron-vortex spectroscopy can probe magnetic sublevel transitions normally studied using circularly polarized photon beams with the advantage of atomic-scale spatial resolution. One of the schemes is shown in Fig. 1 where localization of the energy-loss signal is achieved through confocal arrangement and dipole transition selected through orbital-angular-momentum analyzer. [1] S. Lloyd, M. Babiker and J. Yuan, Phys. Rev. Lett. 108 (2012), 074802 [2] J Verbeeck et al, Nature 467 (2010), p. 301. [3] P. Schattschneider et al, Ultramicroscopy, 136 (2014) p81-5 [4] J Yuan, S. Lloyds and M. Babiker, Phys. Rev. A88, 031801

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Fig. 1: The experimental arrangement optimized for spatially resolved chiral-dependent electron vortex electron energy loss spectroscopy.