**Transformed E&M I materials**

**Biot-Savart Law**

**(Griffiths Chapter 5)**

**STUDENT DIFFICULTIES**

**Setting up the integral (\*\*)**

* The same problems from Coulomb’s Law appear again here. Putting together the pieces of Biot-Savart is a bit of a challenge – many can understand *why* you would use a particular *dl*, or formulation of script-r, but have difficulty coming up with that formulation on their own.

**Cylindrical coordinates (\*\*)**

* Magnetism often involves rotational symmetry about the z-axis, resulting in the use of cylindrical coordinates. These are a little more unfamiliar to students, though they can use them well once prompted. I noticed a general tendency to forget to use cylindrical coordinates or not notice rotational symmetry, or to forget to use operators (such as del) in cylindrical coordinates instead of cartesian.