Subject: Data for ITRVQ graphs of E951 magnets
From: "Robert J. Weggel" <weggel@bnl.gov>
Date: Tue, 15 Jan 2002 00:11:46 -0500
To: <marneris@bnl.gov>, <mcdonald@puphed.princeton.edu>, <gallardo@bnl.gov>
CC: <mikei@bnl.gov>, <titus@psfc.mit.edu>, <kirk@bnl.gov>, <palmer@bnl.gov>

Dear Ioannis et al.,
     The attached file, E951base.out, is output from the Fortran program that
generated the data for the graphs with names beginning with ITRVQ. The
output, and the analysis in the following sentences, should convince you
that Case 3, precooled to 30 K, can indeed reach 7200 A in ~15 s. From the
column labeled MILLIOHMS one can calculate that Case 3 has a resistance that
averages 259.74/15 = 17.3 milliohms over the first 15 s. To this value one
must add any lead resistance, which I estimate as 2 milliohms, for a total
of 19.3 milliohms. If this value remained fixed over that time, the current
predicted at 15 s would be (300 V/0.0193 ohms) {1 - exp [-(15 s)(.0193
ohms)/0.435 H]} = 15531 A [1 - exp(-0.666)] = 15531 A (0.486) = 7549 A. To
reproduce the actual value of current, 7200 A, requires a total resistance
of 22.4 milliohms, hence an average magnet resistance of 20.3 milliohms--a
value that is plausible, is it not?
     Bob W.