

From: FNAL::JBS 18-MAY-1990 15:12:05.99
 To: BOSSERT,CARSON,HANFT,KOSKA,MANTSCH,MAZUR,PEWITT
 CC: MYSELF
 Subj: 50 mm dipole cross section

On Monday, in a phone call and by e-mail (attached below) Gerry Morgan said that Ramesh Gupta had found a cross section that uses the same collars as the W6733, uses the wider (0.486") inner cable with the thin edge packing fraction (rather than the keystone angle) the same as the narrower (0.477") cable and gives better harmonics than the simple 9 mil radial extrapolation of all conductor edges in the W6733. At that point Ramesh was not quite done with the reoptimization and Gerry wondered if there was any point in Ramesh completing the job. I said that I thought it was worth finishing and that we could probably still build the modified cross section. I brought this up at the PSG on Tuesday and Rodger confirmed that we could delay a decision on the final details of the cross section until the end of the week without impacting the schedule. I just called Morgan and he said that after speaking with me he spoke (by phone or e-mail) with Palmer who said there was no point in doing the further optimization, so they stopped. The upshot is that we are indeed to build the W6733A cross section, where the suffix A (see below) implies the 9 mil radial extrapolation of all lines in the W6733. It is expected that this cross section will have $b_2 = -0.95$ units and $b_4 = 0.062$ units. This b_2 is just outside the current specification of $|b_2| < 0.8$ units, and b_4 is just inside the current spec of $|b_4| < 0.08$ units. (The quoted specifications are for the systematic multipoles at high field taken from Table II of the "15 Meter Collider Dipole Magnet Prime Item Development Specification", Preliminary, Rev 0, 6 March, 1990.)

From: BNLDAG::MORGAN 14-MAY-1990 09:28:57.32
 To: FNAL::JBS, JNET%"palmer@slacvm"
 CC:
 Subj: revised 5cm cross section for 9 mil wider cable

My recollection is that Palmer, Goodzeit, Willen and you all agreed that the way to go was extrapolate the turn sides by 9 mil to a new inner radius. I have done this and obtained a new set of turn coordinates. I call this W6733A. In the meantime, Gupta has done a reoptimization holding the collar and turn thin edge unchanged, which has better harmonics and retains most of the desirable features of W6733. So a solution without additional compression is possible. However, Willen's final word on the matter before leaving for Desy Friday was "why bother?". W6733A has $b_2 = -.95$ and $b_4 = 0.062$, compared with $-.28$ and $.009$ for W6733. The first wedge has an insulated thin edge thickness of 20.9 mil, compared to 24.2 mil in the original.