

INVENTORY OF THE SPS KICKERS

E. Métral

- ◆ **The longitudinal resistive-wall impedance, responsible for the kickers' heating, has been analyzed in detail for all kickers**
- ◆ **The transverse impedance, which contributes to the fast instability at injection, has only been studied for the MKE (Extraction) Kickers = Equipments needed for the SPS as LHC injector**
 - **5 installed in 2003**
 - **4 installed during the 2004-2006 shutdown**

LIST OF THE SPS KICKERS (E. Gaxiola, 12/05/06)

Impedance issues inventory

AB-BT SPS kickers

Full

by E. Gaxiola

12-05-2006, (19-04-2006, 24-9-2004, 22-9-2004)

| Magnet | Location | H aperture | V aperture | Tank gap screening | Intermodule screening | Comment |
|---------------------------|------------------------|------------|------------|--------------------|-----------------------|--|
| MKP-S I, 5 module | LSS1 MKP-S 11931 | 100 | 61 | yes | yes | |
| MKP-S II, 5 module | LSS1 MKP-S 11936 | 100 | 61 | yes | yes | |
| MKP-S III, 2 module | LSS1 MKP-S 11952 | 100 | 61 | yes | yes | |
| MKP-L IV, 4 module | LSS1 MKP-L 11955 | 140 | 54 | no | no | For modifications designer needed (2006) |
| spare MKP-S I, 5 module | storage | 100 | 61 | yes | yes | |
| spare MKP-S III, 2 module | storage | 100 | 61 | yes | yes | |
| spare MKP-L IV, 4 module | (under reconstruction) | 140 | 54 | yes | no | |
| MKQH | LSS1 MKQH 11653 | 135 * | 33.9 | No | not applicable | For modifications designer needed (2006) * reduced due to elliptical ceramic inserts (2004) |
| MKQV | LSS1 MKQV 11679 | 102 | 56 | No | not applicable | |
| MKDH-1 | LSS1 MKDH-1 11751 | 56 | 97.1 | No | not applicable | iron silicon core |
| MKDH-2 | LSS1 MKDH-2 11754 | 56 | 97.1 | No | not applicable | iron silicon core |
| MKDH-3 | LSS1 MKDH-3 11756 | 60 | 106.1 | No | not applicable | iron silicon core |
| MKDV-1 | LSS1 MKDV-1 11731 | 56 | 75 | No | not applicable | similar to MKE magnets |
| MKDV-2 | LSS1 MKDV-2 11735 | 56 | 83 | No | not applicable | similar to MKE magnets |
| spare MKDV-2 | AB-BT lab | 56 | 83 | No | not applicable | similar to MKE magnets |
| MKE-L2 | LSS4 MKE-L 41631 | 147.7 | 35 | yes | not applicable | |
| MKE-L5 | LSS4 MKE-L 41634 | 147.7 | 35 | yes | not applicable | |
| MKE-S4 | LSS4 MKE-S 41637 | 135 | 32 | yes | not applicable | |
| MKE-S7 | LSS4 MKE-S 41651 | 135 | 32 | yes | not applicable | |
| MKE-L1 | LSS4 MKE-L 41654 | 147.7 | 35 | yes | not applicable | |
| MKE-L8 | LSS6 MKE-L 61631 | 147.7 | 35 | yes | not applicable | |
| MKE-L9 | LSS6 MKE-L 61634 | 147.7 | 35 | yes | not applicable | |
| MKE-S3 | LSS6 MKE-S 61637 | 135 | 32 | yes | not applicable | |
| MKE-S6 | LSS6 MKE-S 61651 | 135 | 32 | yes | not applicable | Impedance reduction measures on two cells (at extremities) |
| spare MKE-L10 | AB-BT lab | 147.7 | 35 | yes | not applicable | Impedance reduction measures on all cells |

UPDATED TABLE OF THE KICKERS' APERTURES AFTER CROSS-CHECK WITH E. GAXIOLA (G. Arduini, 01/06/06)

| @ | PARTICLE | %06s | PROTON | | | | | | |
|----|--------------|-------|---------------------|------------|-------------|--------------|-------------|----------------|----------------|
| @ | PC | %le | 26 | | | | | | |
| @ | GAMMA | %le | 27.72855253 | | | | | | |
| @ | LENGTH | %le | 6911.5038 | | | | | | |
| @ | GAMMATR | %le | 22.77284397 | | | | | | |
| @ | Q1 | %le | 26.12992431 | | | | | | |
| @ | Q2 | %le | 26.18084922 | | | | | | |
| @ | DQ1 | %le | 0.439325966 | | | | | | |
| @ | DQ2 | %le | 0.319623397 | | | | | | |
| @ | ORIGIN | %19s | MAD-X 3.01.01 Win32 | | | | | | |
| @ | DATE | %08s | 13/04/06 | | | | | | |
| @ | TIME | %08s | 18.40.17 | | | | | | |
| * | NAME | | s [m] | LENGTH [m] | BETX [m] | DX [m] | BETY [m] | FULLAPERX [mm] | FULLAPERY [mm] |
| \$ | %s | | %le | %le | %le | %le | %le | %le | %le |
| | MKQH.11653** | | 524.6862 | 0.96 | 64.51713859 | -0.203834072 | 37.18877804 | 115 | 32.3 |
| | MKQV.11679 | | 535.7712 | 1.416 | 33.88229322 | -0.265543616 | 70.08046855 | 102 | 56 |
| | MKDV.11731 | MKDVA | 550.619 | 2.892 | 25.67939112 | -0.422827627 | 88.2797746 | 75 | 56 |
| | MKDV.11736 | MKDVB | 553.81 | 2.892 | 31.20924701 | -0.487568806 | 75.4367941 | 83 | 56 |
| | MKDH.11751 | MKDHA | 556.021 | 1.6 | 35.78005965 | -0.532427078 | 67.27627624 | 96 | 56 |
| | MKDH.11754 | MKDHA | 557.92 | 1.6 | 40.18894924 | -0.570955282 | 60.74970389 | 96 | 56 |
| | MKDH.11757 | MKDHB | 559.819 | 1.6 | 45.04424364 | -0.609483486 | 54.66890535 | 105 | 60 |
| | MKPA.11931 | MKPA | 615.0954 | 3.423 | 26.32855499 | -0.216015187 | 85.77846538 | 100 | 61 |
| | MKPA.11936 | MKPA | 618.7174 | 3.423 | 32.83404863 | -0.181650065 | 71.5862138 | 100 | 61 |
| | MKPC.11952 | MKPC | 620.6964 | 1.78 | 37.07009874 | -0.162873539 | 64.51516613 | 100 | 61 |
| | MKP.11955 | MKP | 624.3184 | 3.423 | 46.07038936 | -0.128508417 | 52.82431039 | 140 | 54 |
| | MKE.41631 | MKEL | 3973.3482 | 2.014 | 91.97523046 | -0.162968793 | 24.03938714 | 147.7 | 35 |
| | MKE.41634 | MKEL | 3975.6612 | 2.014 | 82.32729483 | -0.175742387 | 27.57626338 | 147.7 | 35 |
| | MKE.41637 | MKES | 3977.9742 | 2.014 | 73.33678277 | -0.18851598 | 31.77220251 | 135 | 32 |
| | MKE.41651 | MKES | 3980.2872 | 2.014 | 65.00369429 | -0.201289573 | 36.62720455 | 135 | 32 |
| | MKE.41654 | MKEL | 3982.6002 | 2.014 | 57.32802939 | -0.214063166 | 42.1412695 | 147.7 | 35 |
| | MKE.61631 | MKEL | 6277.1828 | 2.014 | 92.08548438 | -0.148157569 | 24.11653436 | 147.7 | 35 |
| | MKE.61634 | MKEL | 6279.4958 | 2.014 | 82.4230454 | -0.161396499 | 27.70271087 | 147.7 | 35 |
| | MKE.61637 | MKES | 6281.8088 | 2.014 | 73.41886037 | -0.174635428 | 31.95216455 | 135 | 32 |
| | MKE.61651 | MKES | 6284.1218 | 2.014 | 65.07292927 | -0.187874358 | 36.86489539 | 135 | 32 |

** inner dimensions of the ceramic insert

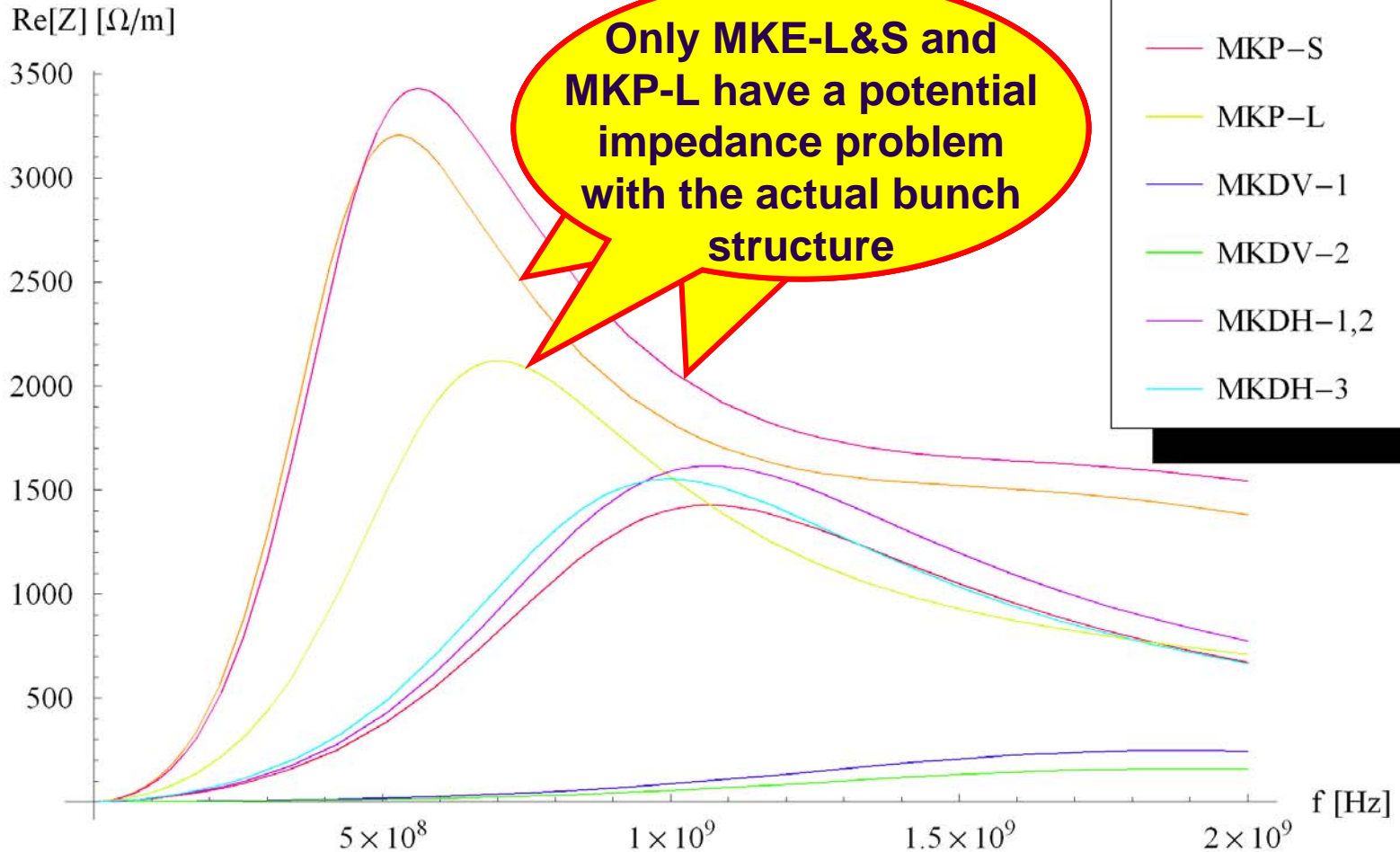
SPS KICKERS' LONGITUDINAL IMPEDANCE

(J. Uythoven, 11/05/06)

Tsutsui (CERN-SL-2000-004 AP)

Per longitudinal meter!

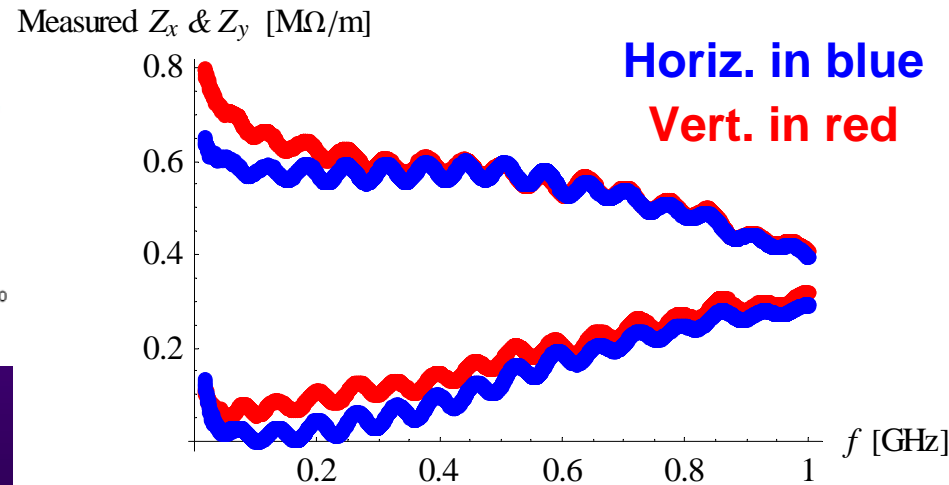
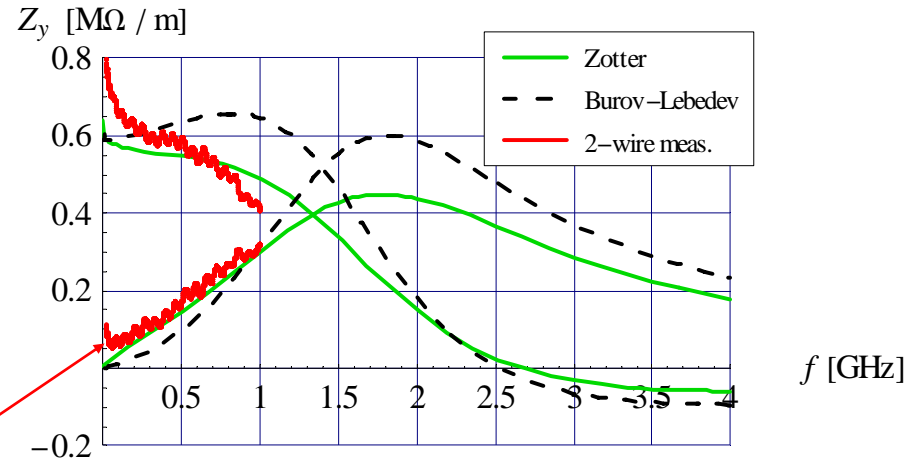
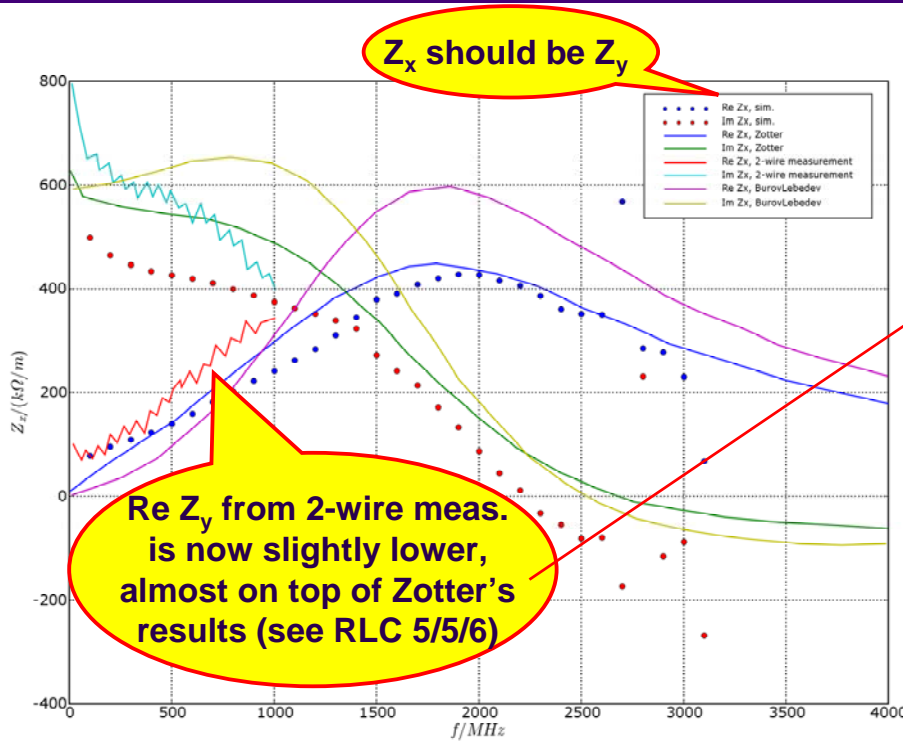
SPS Kicker Impedances, Jan Uythoven, May 2006



SPS KICKERS' TRANSVERSE IMPEDANCE (1/2)

(See RLC meetings, 05&19/05/06)

⇒ For 1 MKE kicker (MKE-L8) only for the moment



SPS KICKERS' TRANSVERSE IMPEDANCE (2/2)

- ◆ **Measurements have also been performed by F. Caspers and T. Kroyer on the (spare) MKE-L10, which is fully shielded (with stripes) ⇒ Being analyzed**