

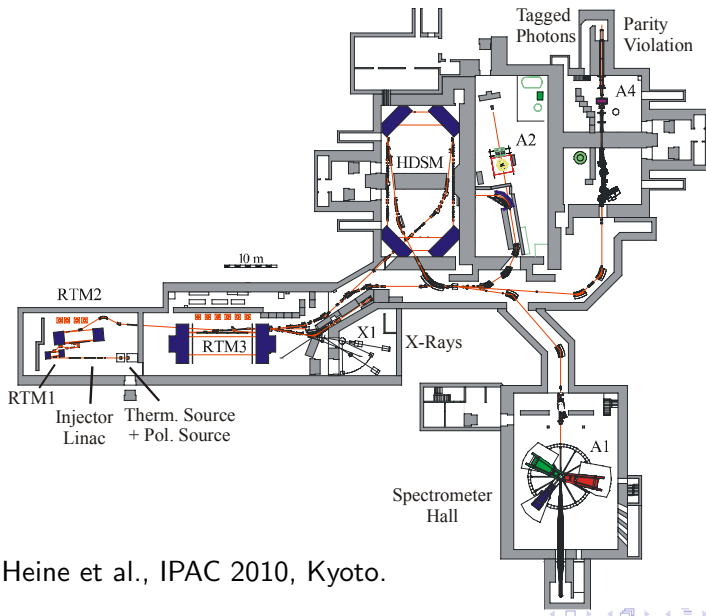
MAMI Test Beam

MAMI = Mainzer Mikrotron

Frank Porter

May 29, 2011

MAMI Floorplan



Heine et al., IPAC 2010, Kyoto.

MAMI Test Beam

<http://www.kph.uni-mainz.de/eng/108.php>

<http://wwwa2.kph.uni-mainz.de/microscope/>

McGeorge et al., Eur. Phys. J. A (2008) DOI 10.1140/epja/i2007-10606-0

- ▶ Up to 1.6 GeV electron primary beam, essentially CW
- ▶ Beam energy stability to 10^{-6} (Dehn et al., IPAC 2010)
- ▶ Energy measured to 140 keV
- ▶ Provides tagged photon beam
 - ▶ Scattered e^- measured in spectrometer
 - ▶ $E_\gamma = 5 - 93\%$ of primary electron, e.g., 23–1488 MeV
 - ▶ Bremsstrahlung photon resolution $\Delta p = 1$ MeV (FWHM) [Happacher]
 - ▶ Resolution ~ 4 MeV FWHM at 1500 MeV (focal plane detector), perhaps ~ 0.4 MeV FWHM at 1500 MeV over restricted solid angle (focal plane microscope)
 - ▶ Rate tunable up to 2.5×10^5 photons/s/MeV
 - ▶ Spot size ~ 8 mm diameter [Happacher]
 - ▶ Tag signal can be used in trigger
 - ▶ Contact (A2 spokesperson): Andreas Thomas (thomas@kph.uni-mainz.de)

MAMI Photon Energy Calibration

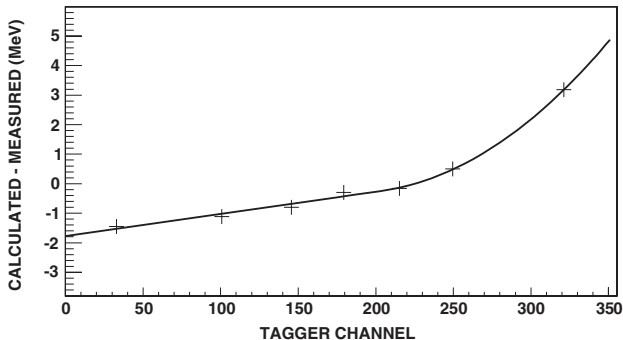


Fig. 7. Upper part: tagger energy calibration for a main beam energy of 1508 MeV measured using MAMI energies 195.2, 405.3, 570.3, 705.3, 855.3, 1002.3 and 1307.8 MeV. The line shows the calibration calculated assuming a uniform field. Lower part: difference between the calculated and measured calibrations. The line here shows a smooth fit to the seven measured points and indicates the small correction to the calculated calibration required because of large-scale field non-uniformity.

MAMI Technical Data

Technical Data



JOHANNES GUTENBERG
UNIVERSITÄT MAINZ

Technical Data

Stage	MAMI B	MAMI C
Final Energy	855.1 MeV	1508 MeV
Circulations	90	43
Magnetic Field (deflecting magnets)	1.28 T	0.95 - 1.53 T
Mass (deflecting magnets)	2x450 t	4x250 t
Microwave Frequency	2.45 GHz	2.45 / 4.90 GHz
Microwave Power	102 kW	117 / 128 kW
Length (linear accelerator)	8.9 m	8.6 / 10.1 m
Size of the Alignment (L x W)	21 m x 10	30 m x 15 m

Comment: The size only relates to the area covered by the deflecting magnets.

