

International Conference on Muon Catalyzed
Fusion and Related Topics (muCF-07)

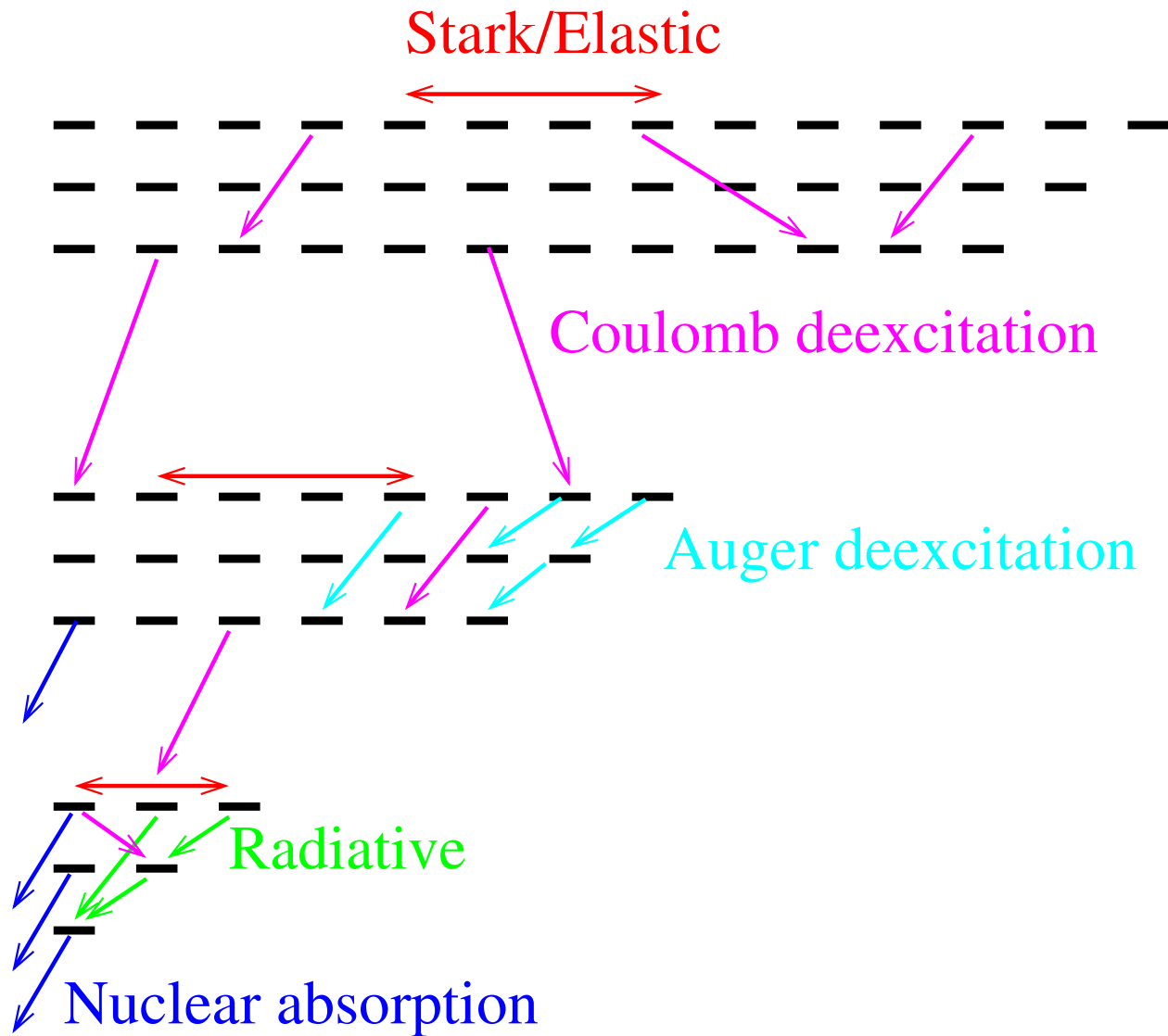
Dubna, 18-21 June 2007

Kinetics of Atomic Cascade in Muonic and Hadronic Hydrogen Atoms

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Cascade scheme



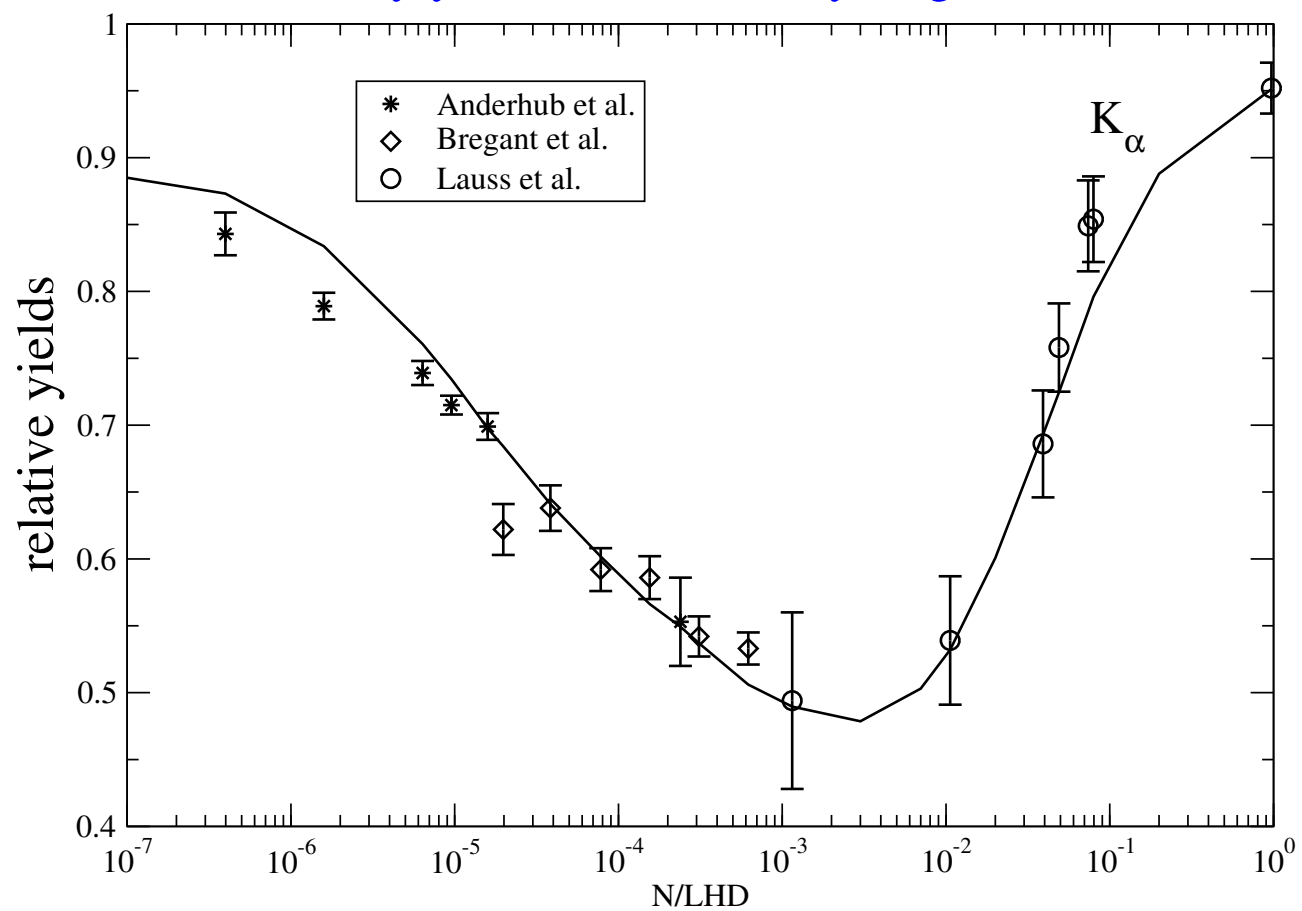
Cascade models

Standard cascade model: E_{kin} fixed through the cascade. (X-ray yields, cascade times)

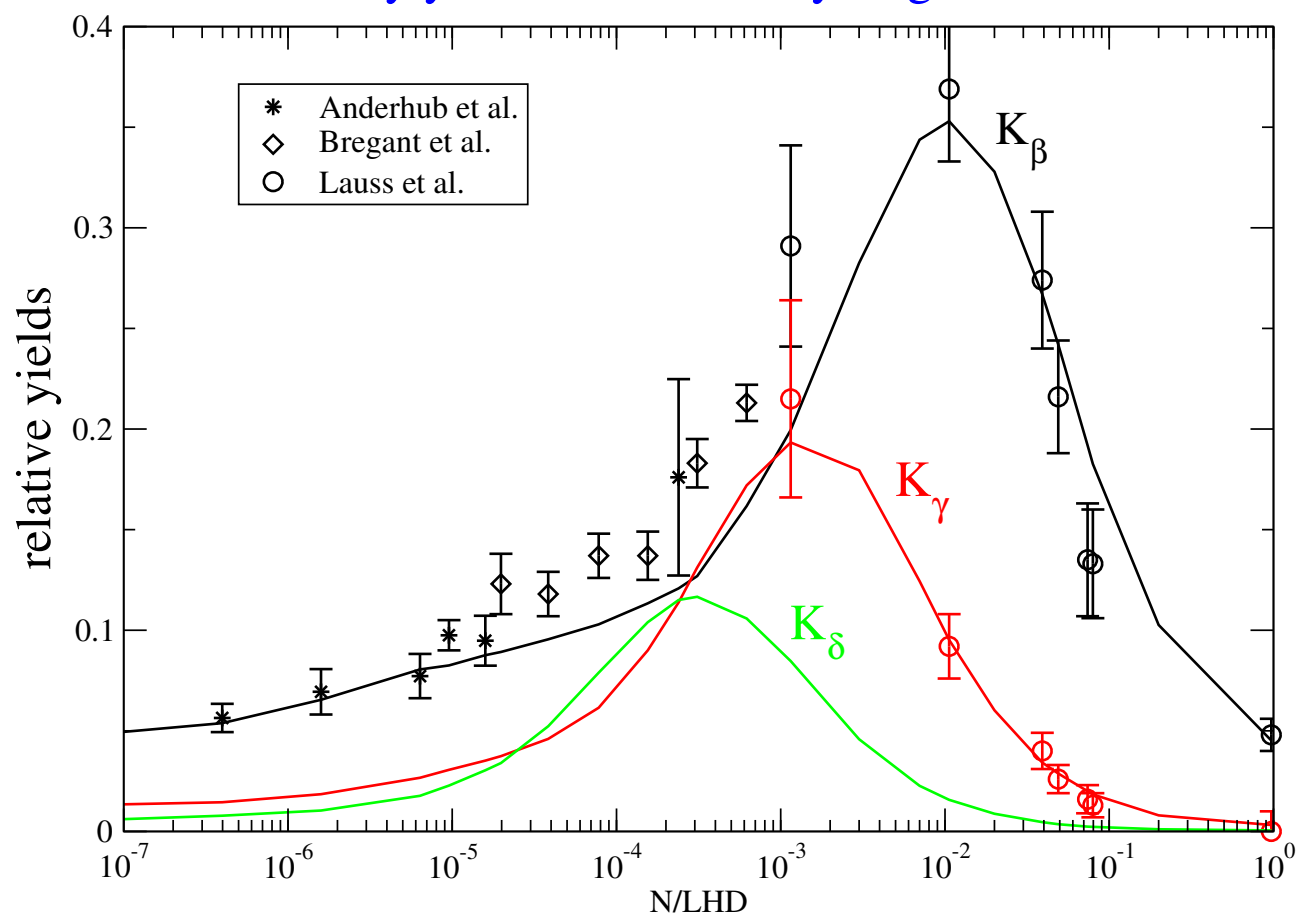
Extended standard cascade model: Detailed kinetics calculations. (Doppler broadening corrections, $\mu^-p(2s)$ population, etc.)

Model	n	l	E_{kin}
Leon, Bethe (1962)	+	–	–
Borie, Leon (1980)	+	+	–
Reifenröther, Klempt (1989)	+	+	–
Markushin (1994)	+	+	+
Aschenauer, Markushin (1996)	+	+	+
Terada, Hayano (1997)	+	+	–
Faifman (2001)	+	+	+
Koike (2001)	+	+	+
T.J., Markushin (2002)	+	+	+

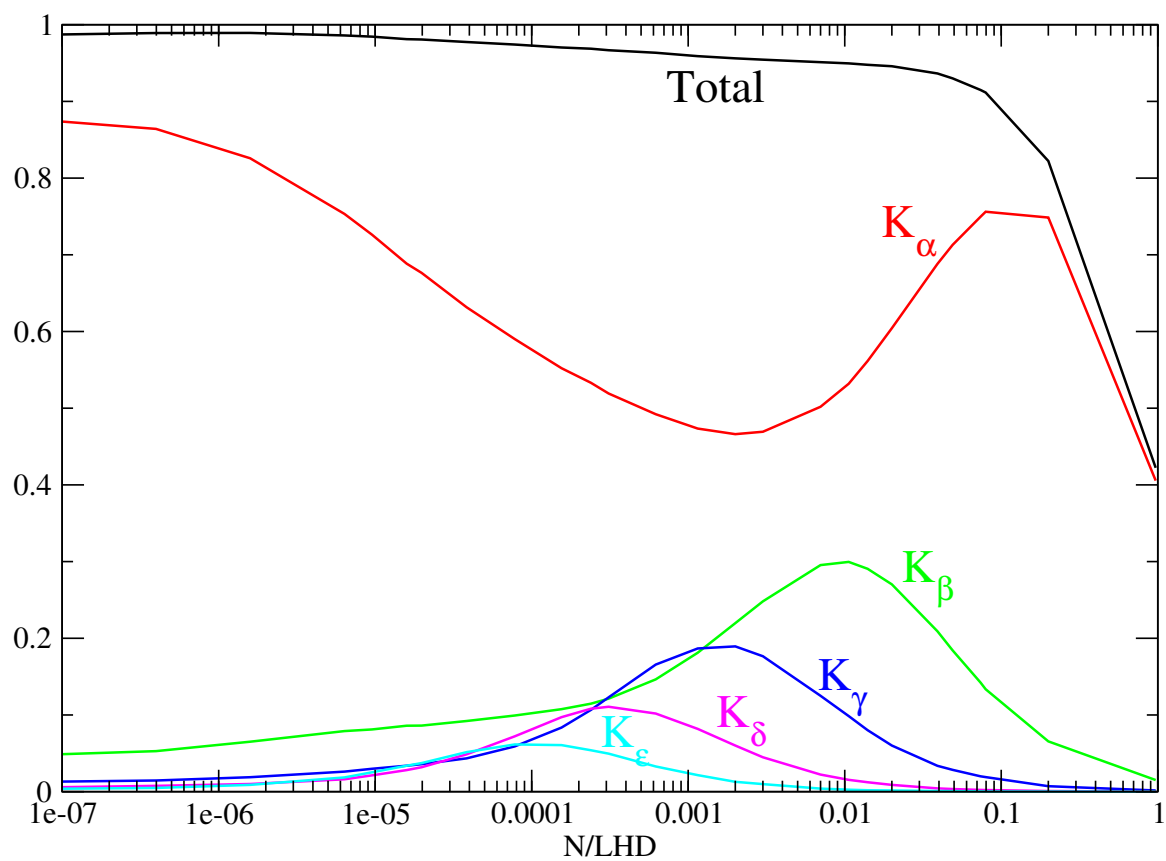
X-ray yields in muonic hydrogen



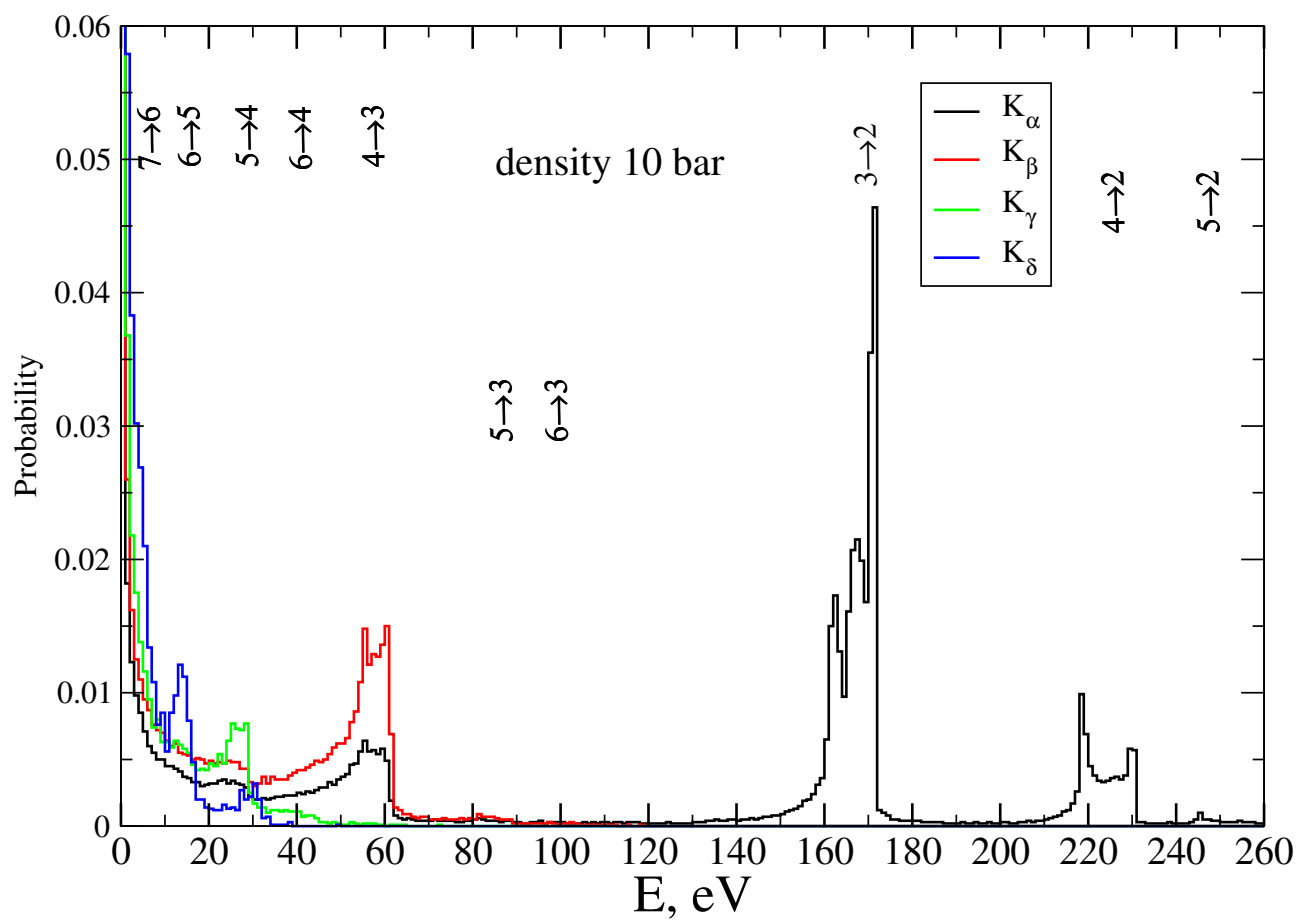
X-ray yields in muonic hydrogen



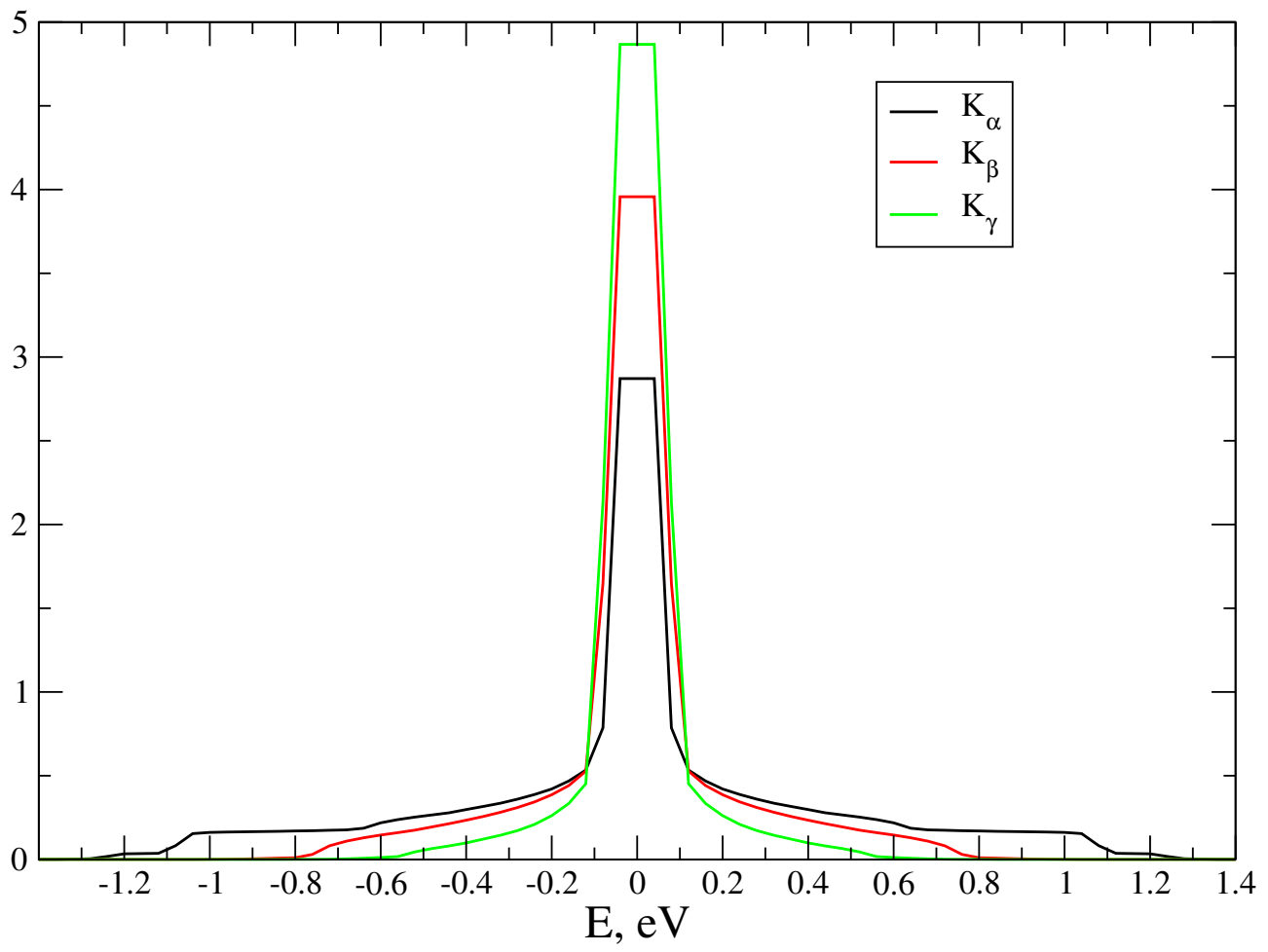
Absolute X-ray yields in muonic hydrogen

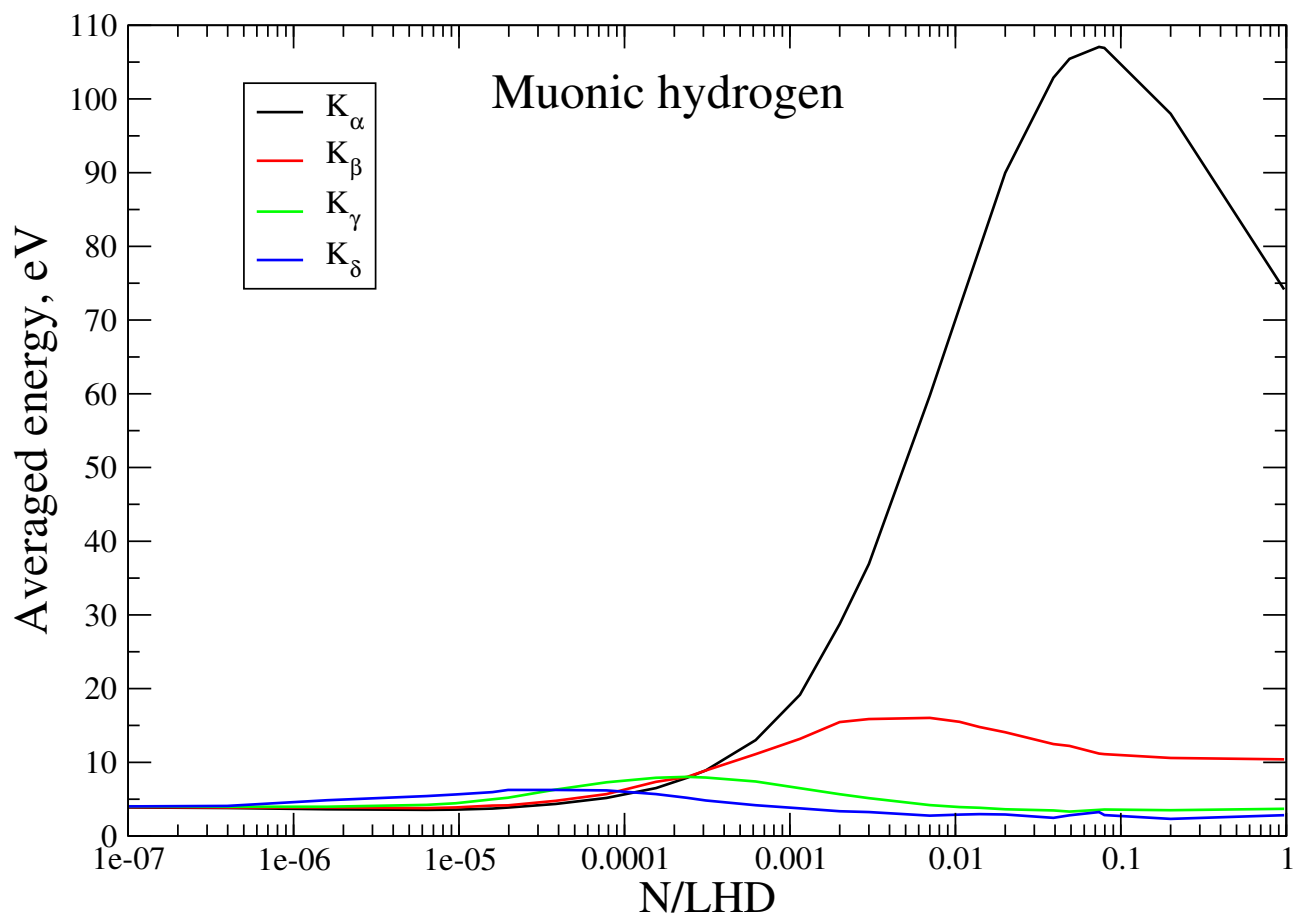


Energy distributions of muonic hydrogen atoms

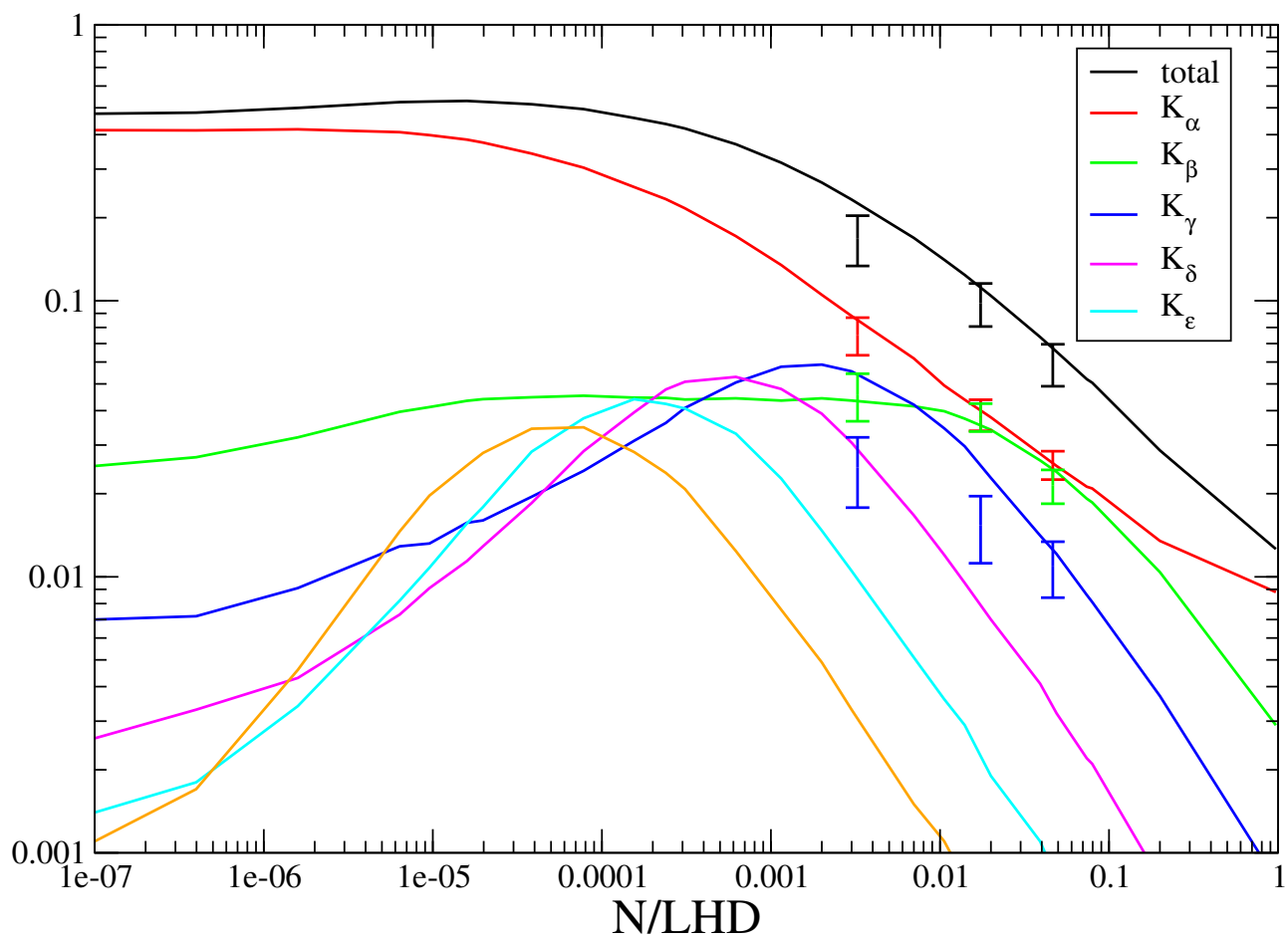


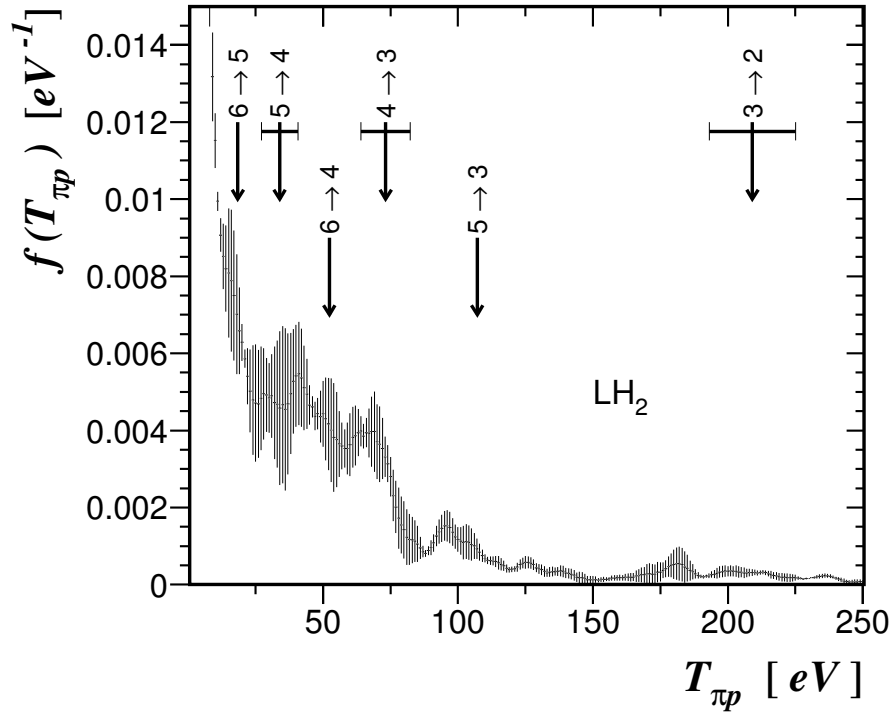
Doppler broadening of X-ray lines in muonic hydrogen





Absolute X-ray yields in pionic hydrogen





density LHD

