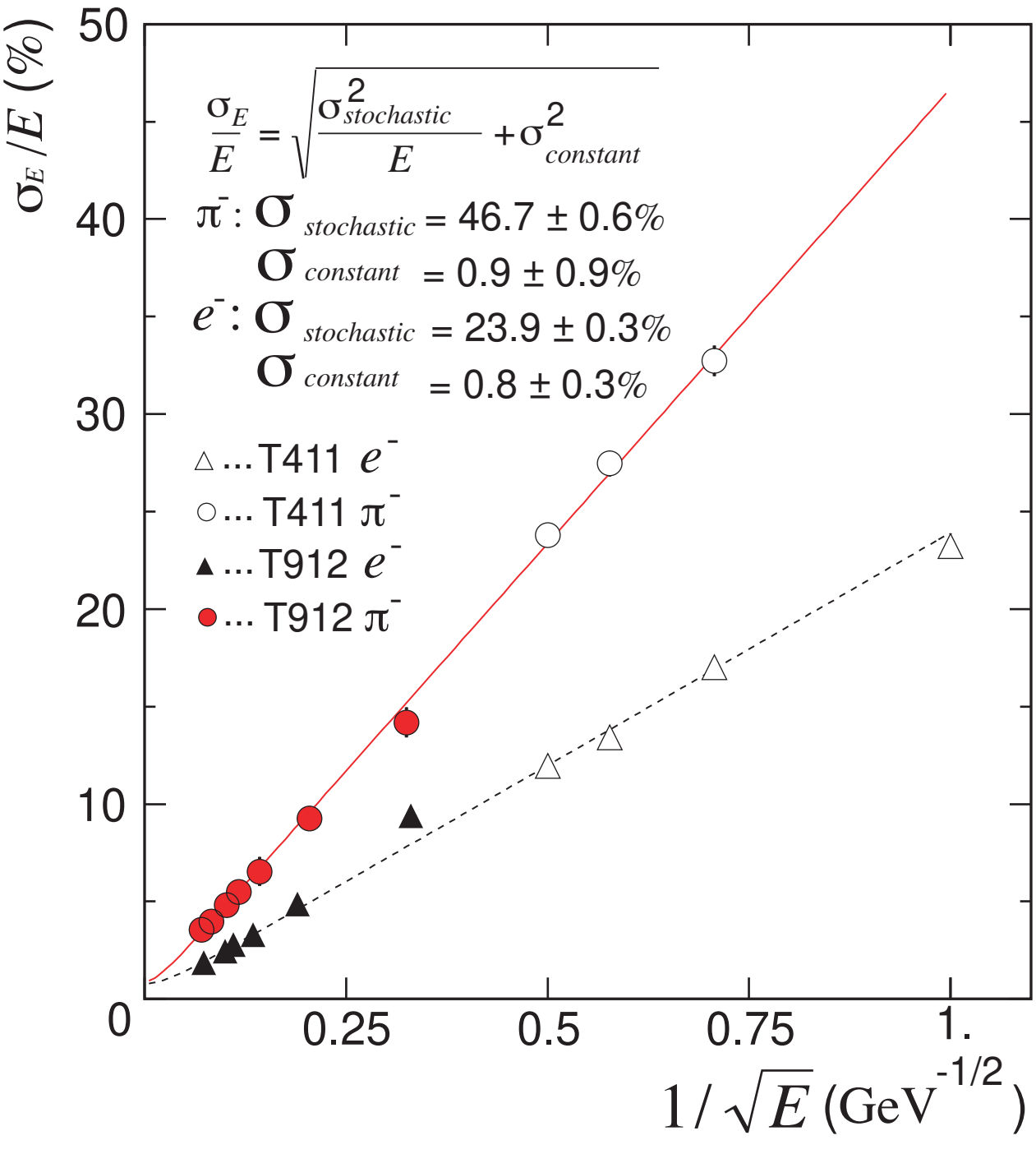
a) Energy Resolution

sm06


$\frac{\sigma_E}{E} = \sqrt{\frac{\sigma^2_{stochastic}}{E} + \sigma^2_{constant}}$
π^-: $\sigma_{stochastic}$ = 46.7 ± 0.6%
$\sigma_{constant}$ = 0.9 ± 0.9%
e^-: $\sigma_{stochastic}$ = 23.9 ± 0.3%
$\sigma_{constant}$ = 0.8 ± 0.3%
△ ... T411 e^-
○ ... T411 π^-
▲ ... T912 e^-
● ... T912 π^-
σ_E / E (%)
$1/\sqrt{E}$ (GeV$^{-1/2}$)
0
10
20
30
40
50
0.25
0.5
0.75
1.

π ; $\sigma_E/E = 46.7 \pm 0.6\%/\sqrt{E} + 0.9 \pm 0.9\%$

worse than design due to 'fiber-routing' acryl plate

•••• Should be OK but needs verification.

Effect of acryl plate (measured by beam tests)

- No effect on compensation if placed downstream of scintillator
- No effect on EM energy resolution regardless its location
- Deteriorate hadron energy resolution regardless its location

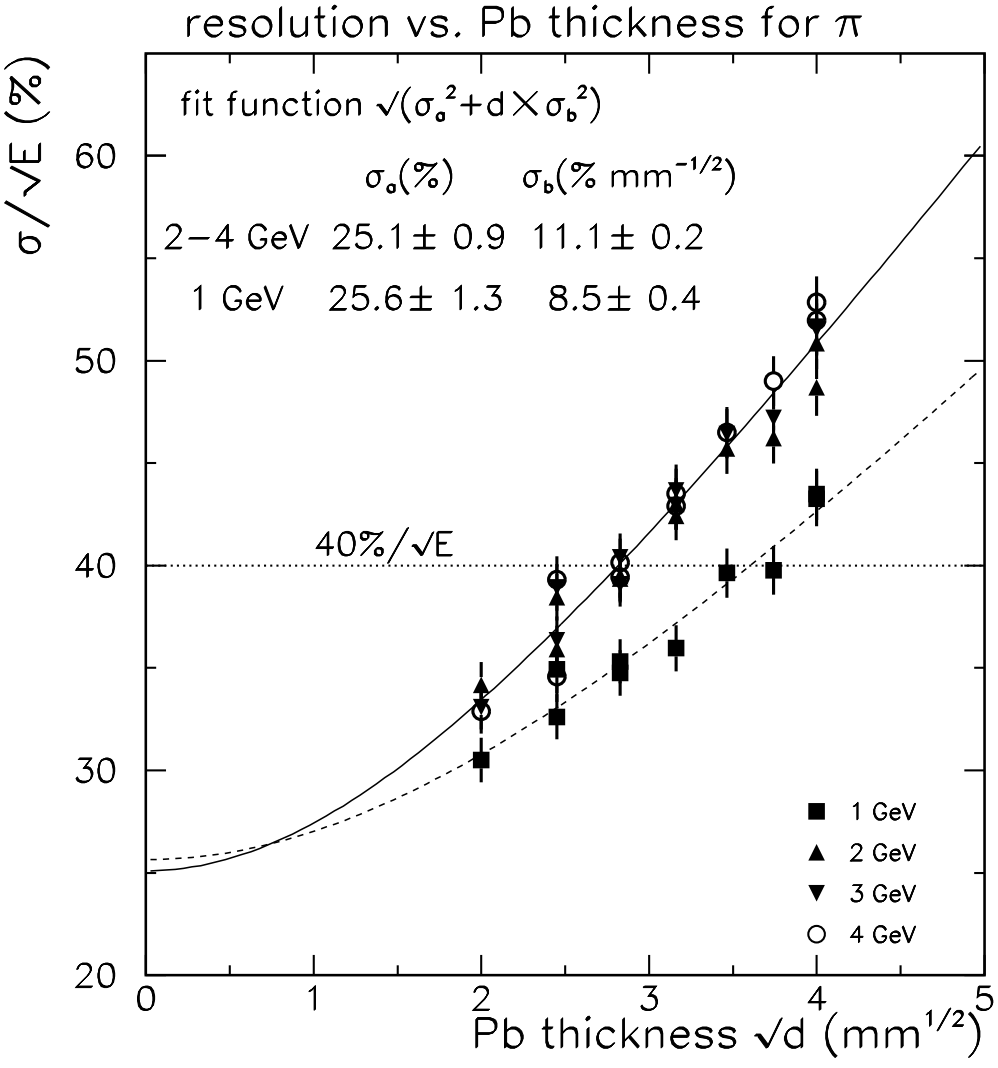


Figure 5.22: Energy resolution vs. Pb thickness for π's Solid and dashed curves shown in the figure are fitting results to Eq. (5.2) except for 1 GeV and 1 GeV. Dotted line in the figure is the requirement of the energy resolution for the JLC hadron calorimeter.

Energy resolution of tile/fiber hadron calorimeter test module.

Beam test result of acryl plate effect (4GeV)

Position of Acryl	EM resolution	π resolution	e/π ratio
No acryl plates	12.0±0.5 %	20.5±0.4 %	1.03±0.02
Upstream of Sci	11.6±0.5 %	22.7±0.4 %	1.07±0.02
Downstream of Sci	12.0±0.5 %	22.8±0.4 %	1.01±0.02

Energy resolution of HCAL test module w/o acryl plates.