Helium and beryllium isotope separation

Comparison of two aerogel radiators
(n = 1.03 & 1.05)

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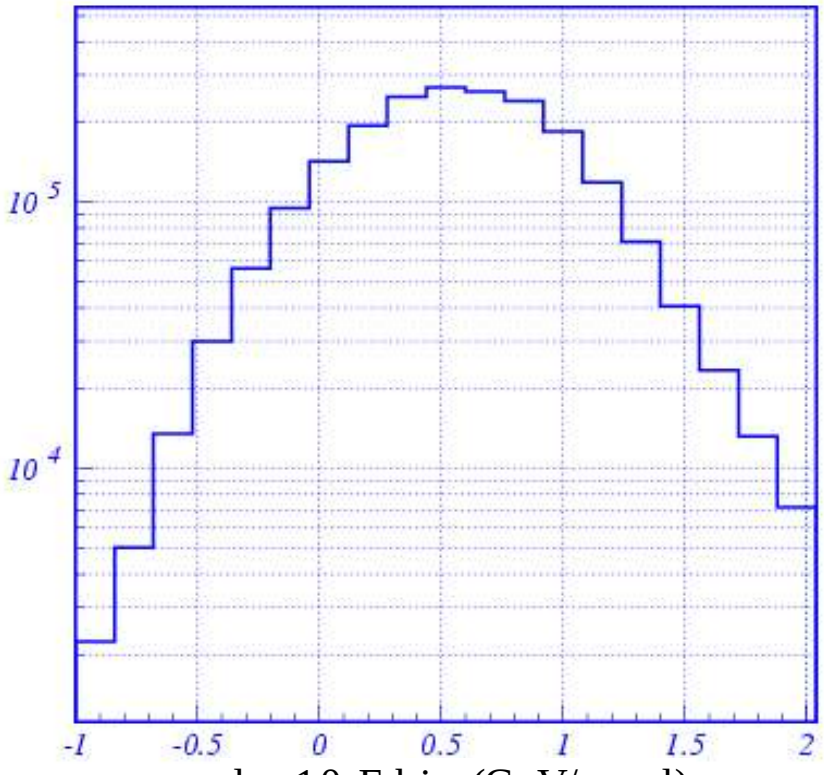
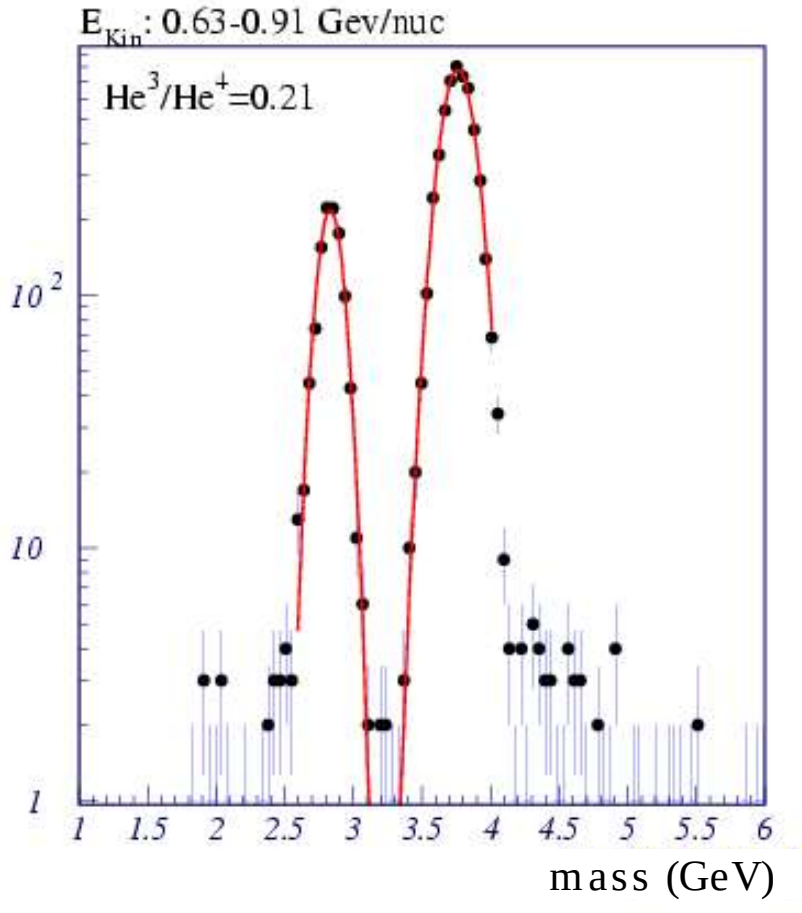
Helium and beryllium isotope separation

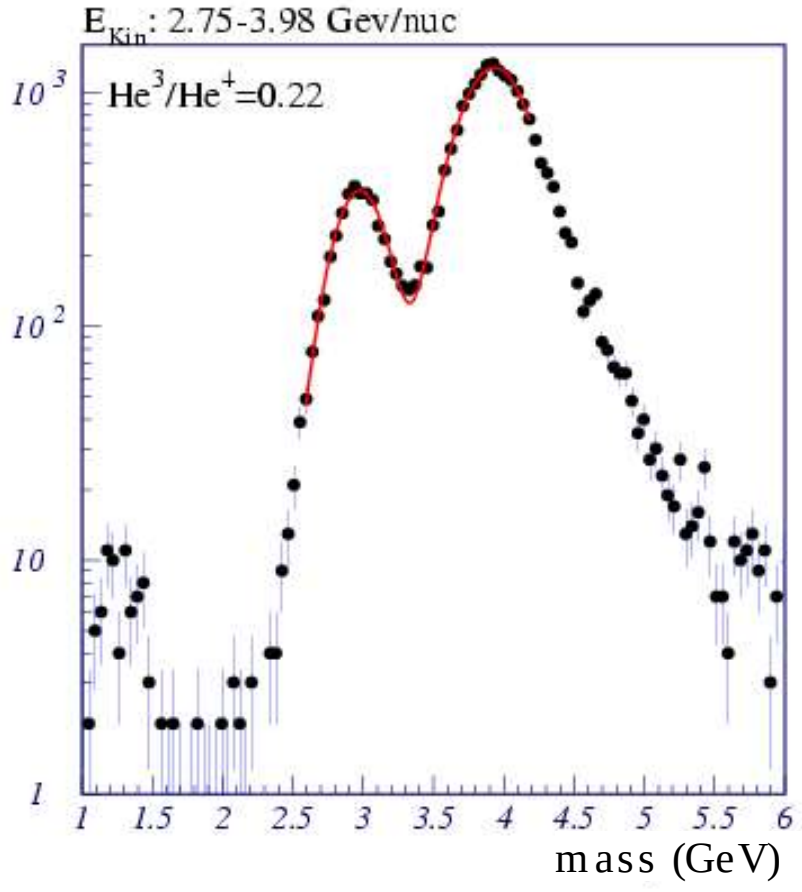
- Monte Carlo simulation of He3 & He4 and Be9 & Be10 isotopes
  - Helium: 2.0 x 10^6 events
  - Beryllium: 8.5 x 10^5 events
- Velocity reconstruction performed with RICH
- Tracker momentum uncertainty smeared
- Elemental abundance evaluated through mass fit

Simulated energy spectrum: Helium

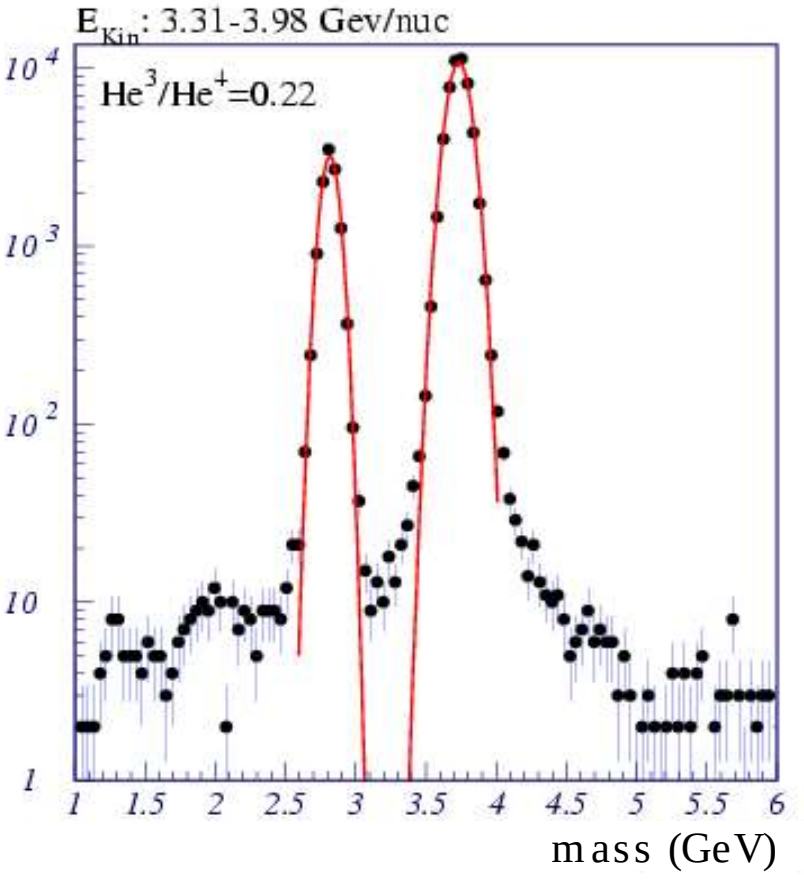


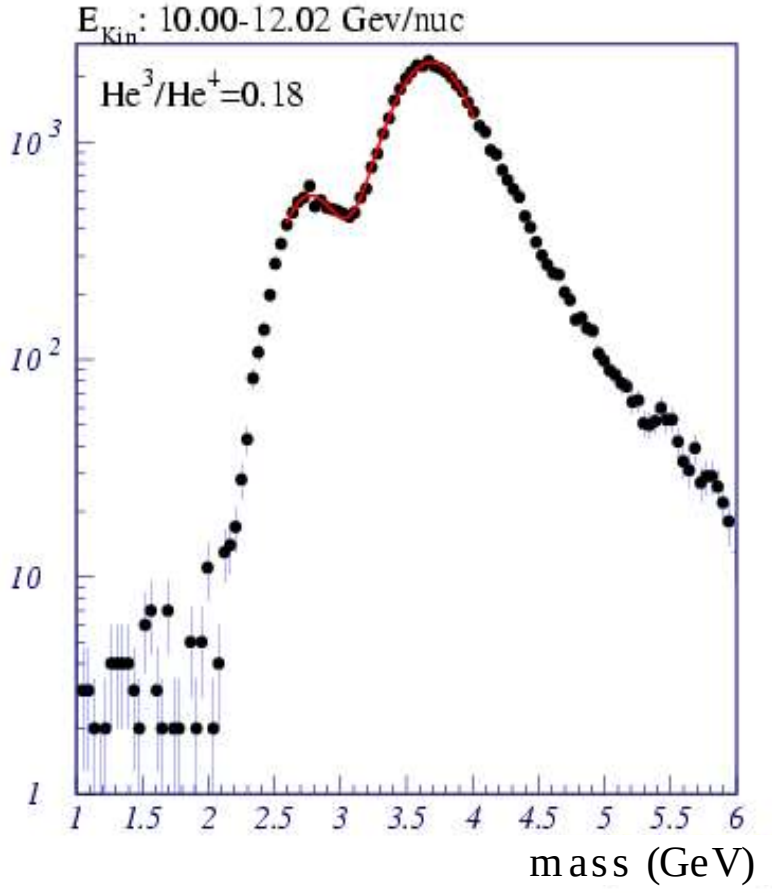
Reconstructed masses: Helium in NaF



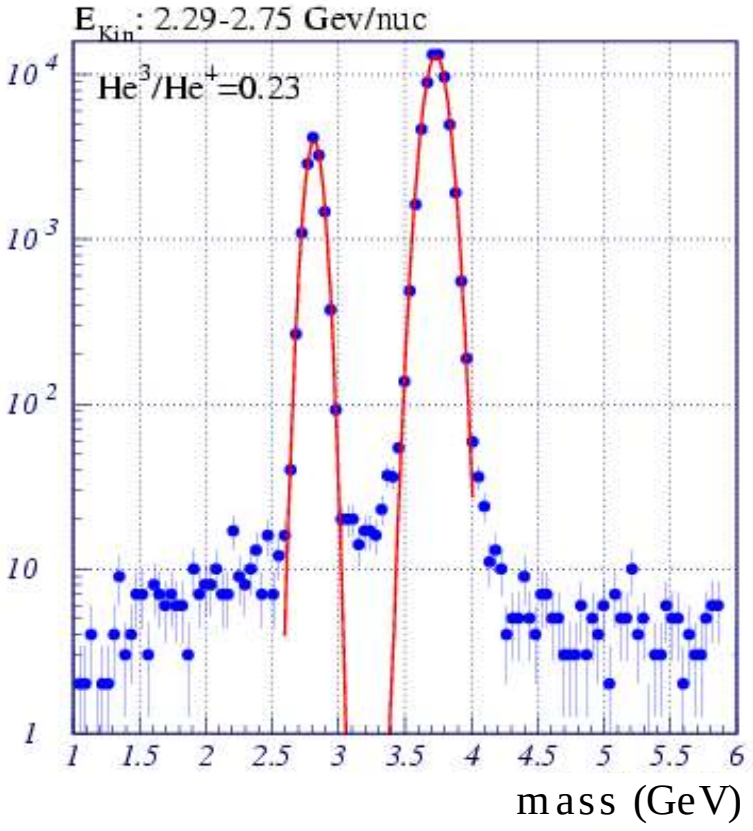


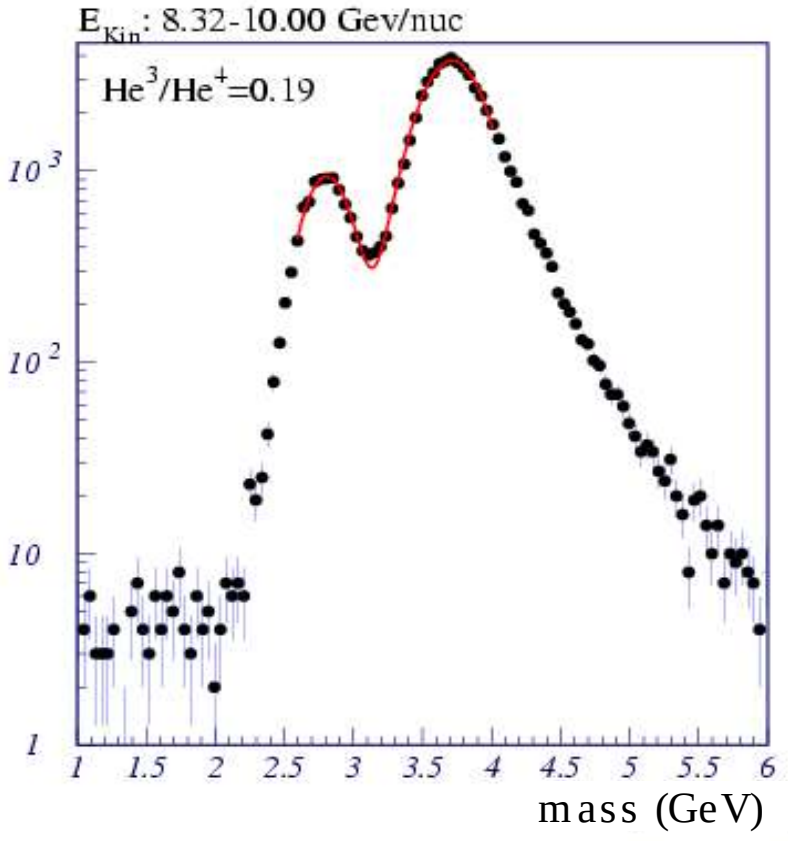
Reconstructed masses: Helium in AGL 1.03



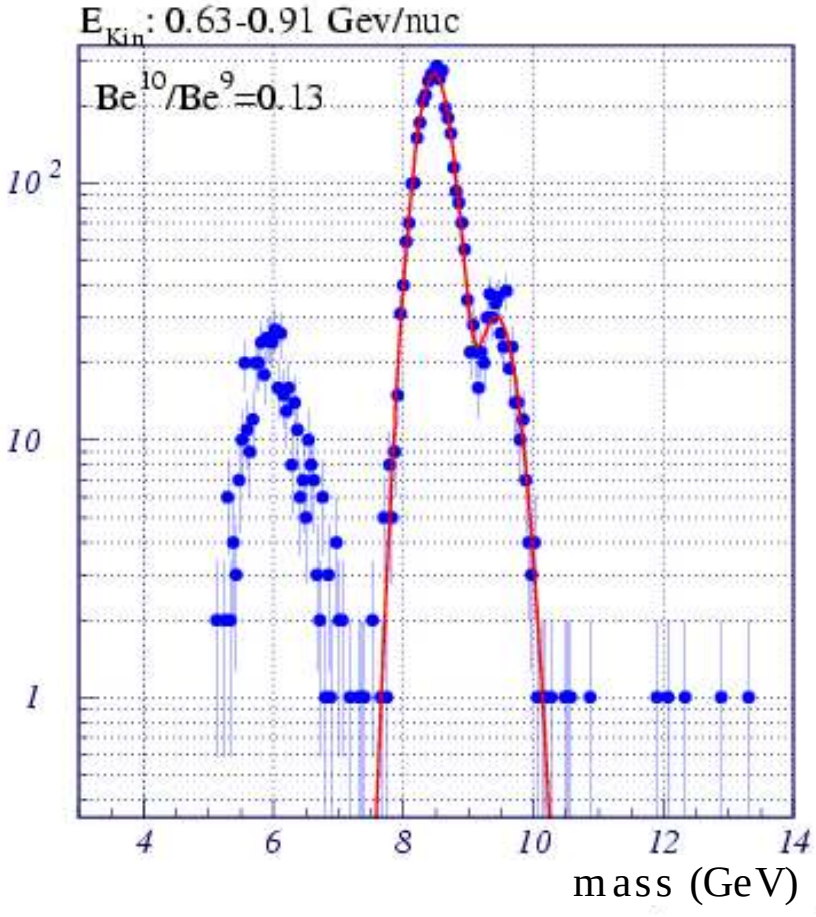


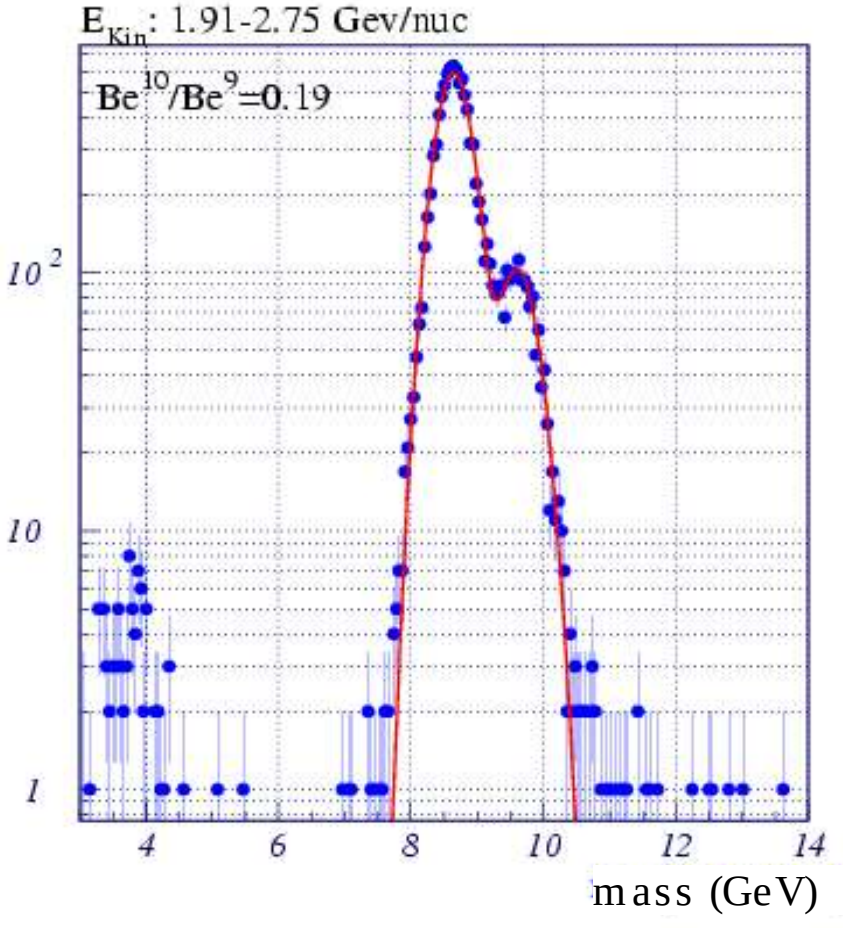
Reconstructed masses: Helium in AGL 1.05



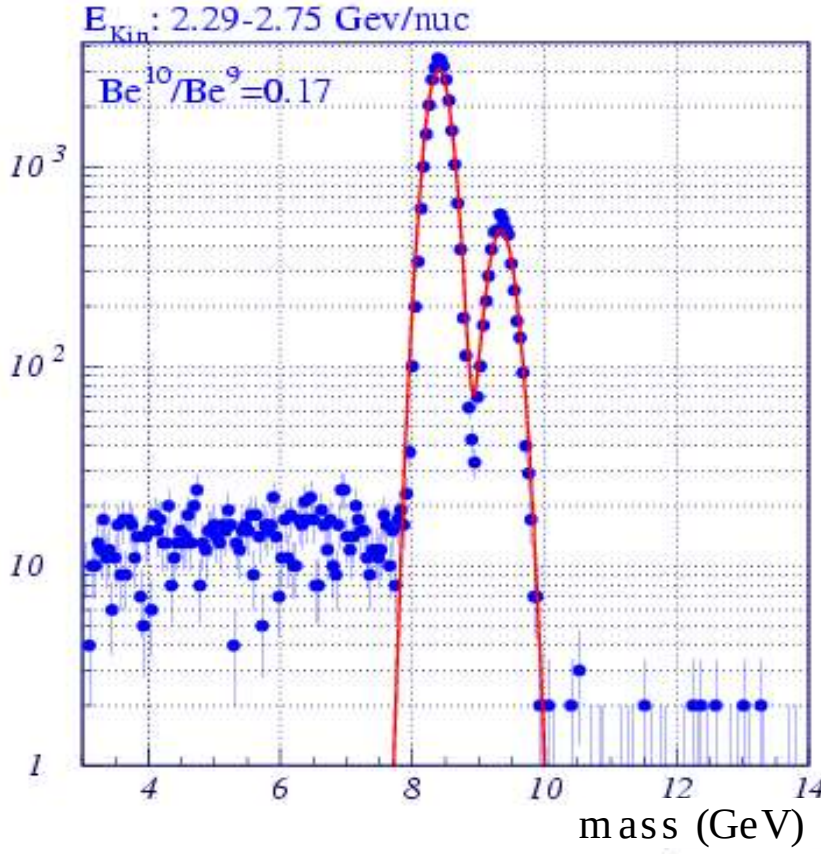


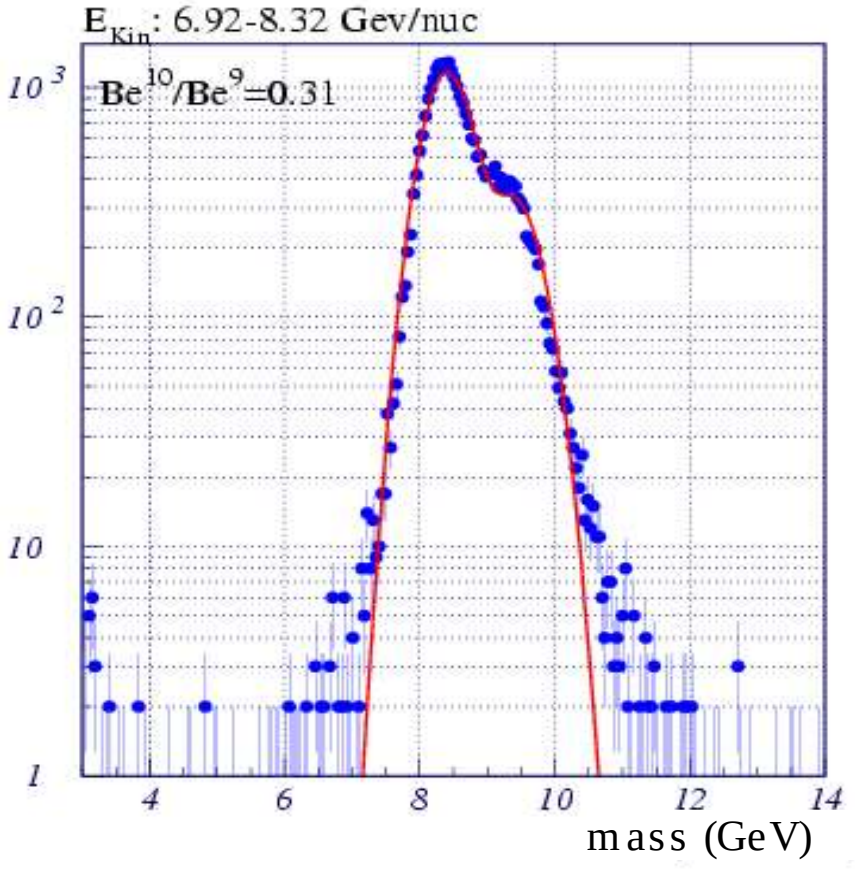
Reconstructed masses: Beryllium in NaF



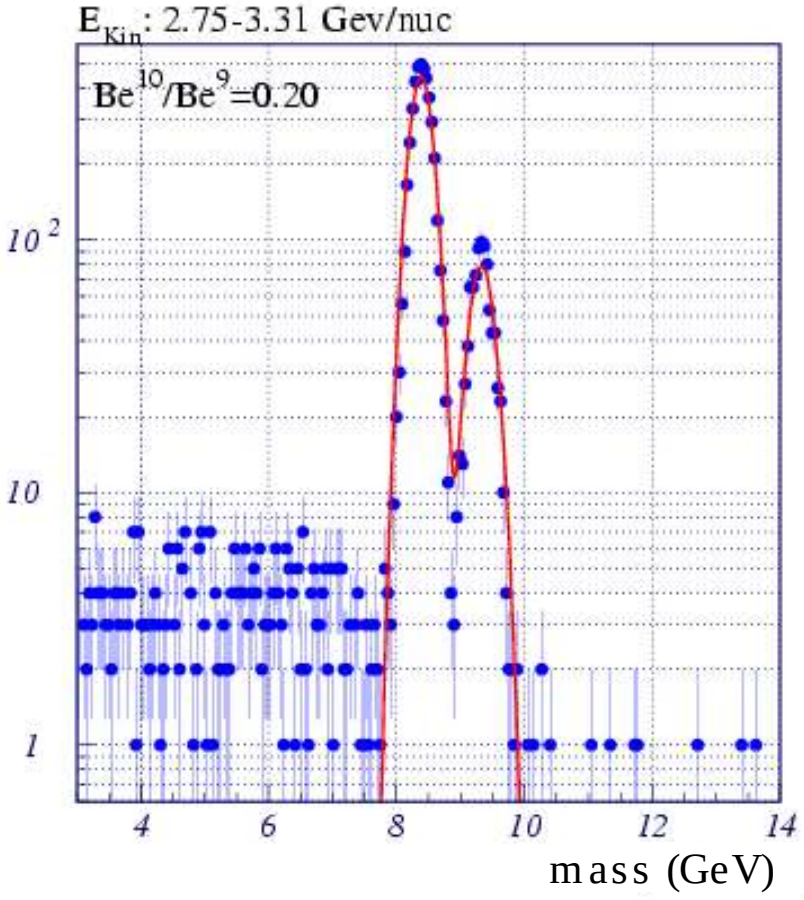


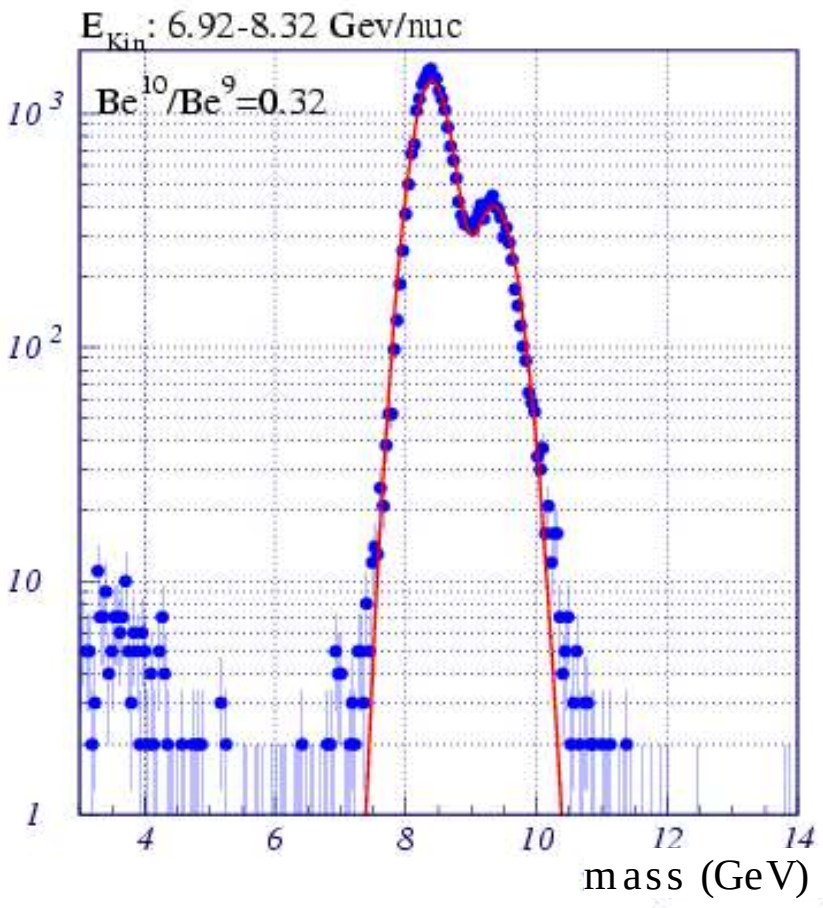
Reconstructed masses: Beryllium in AGL 1.05





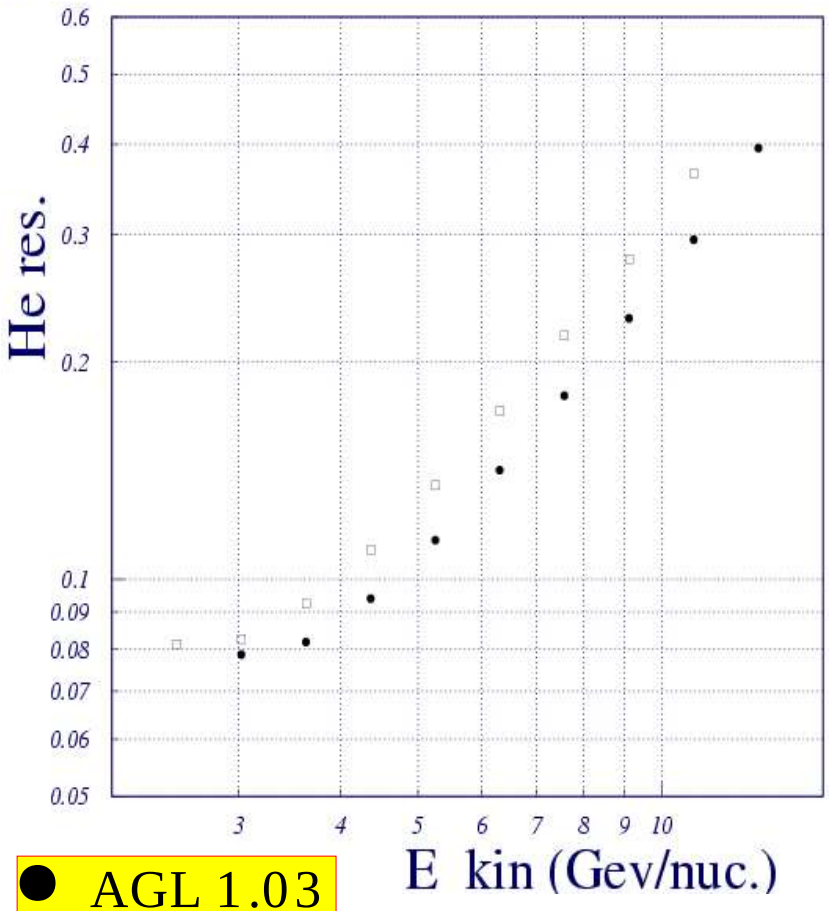
Reconstructed masses: Beryllium in AGL 1.03



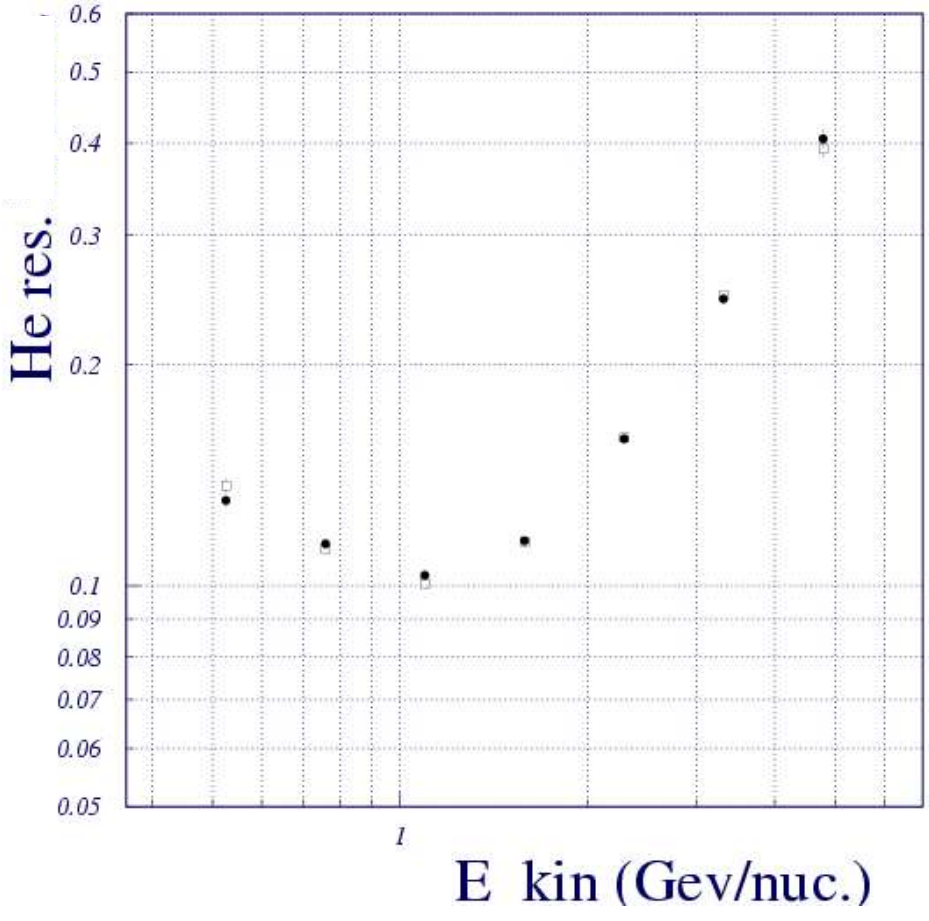


Mass resolution: Helium

AGL

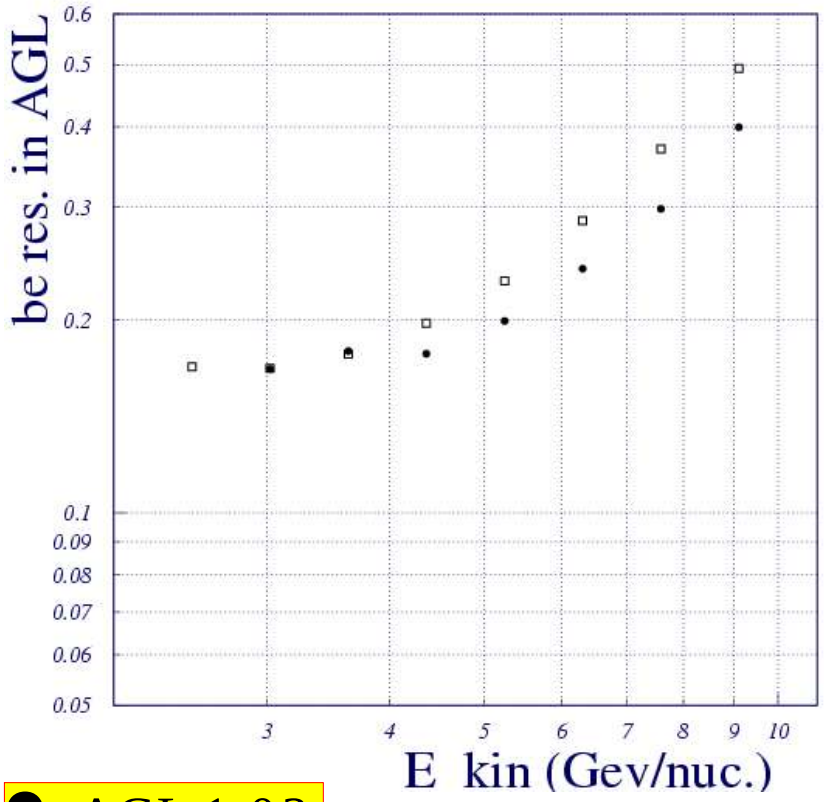


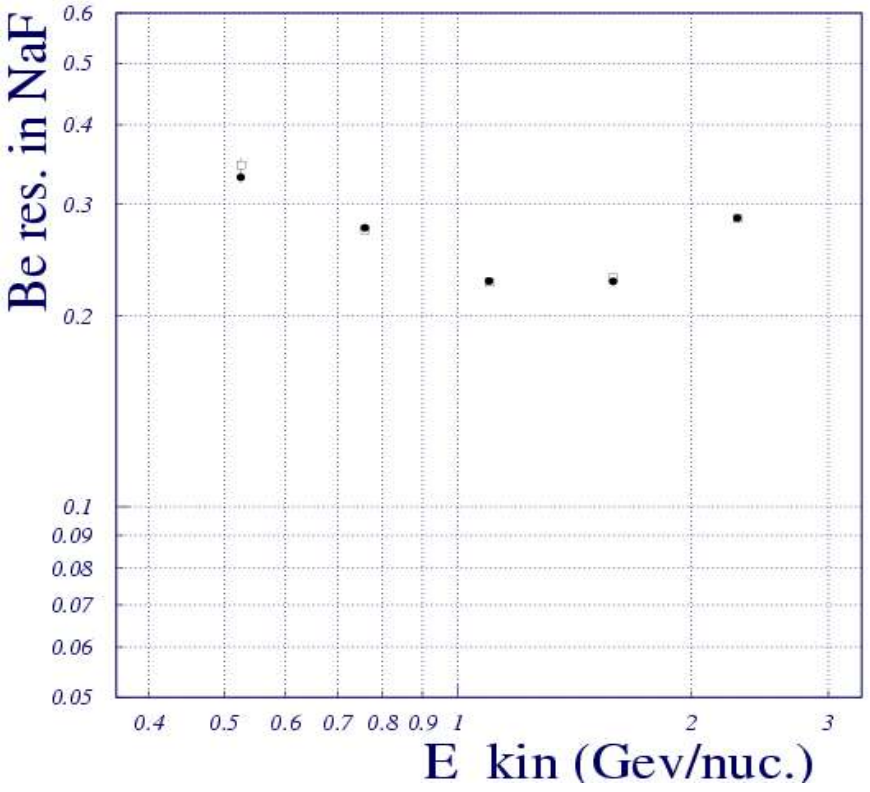
NaF



● AGL 1.03
AGL 1.05

Mass resolution: Beryllium

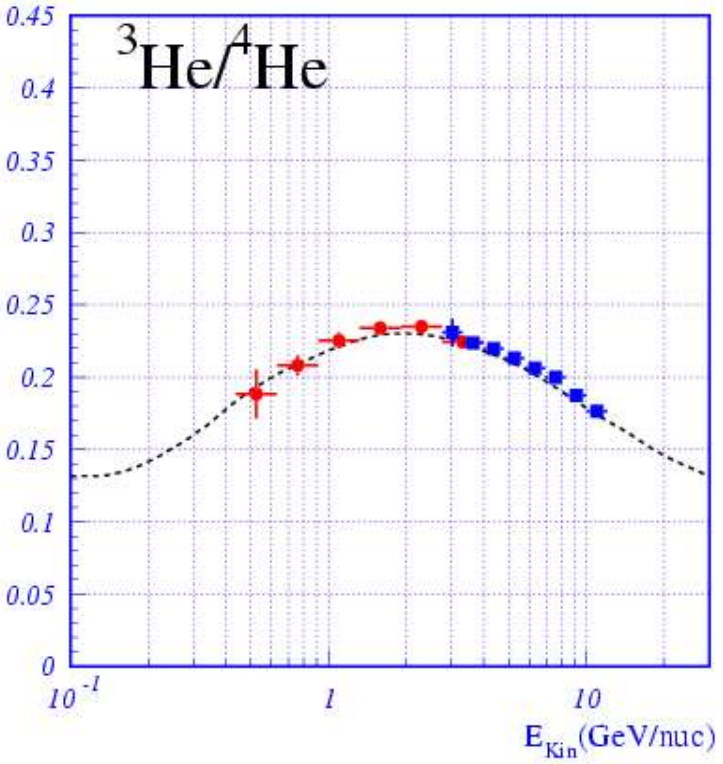




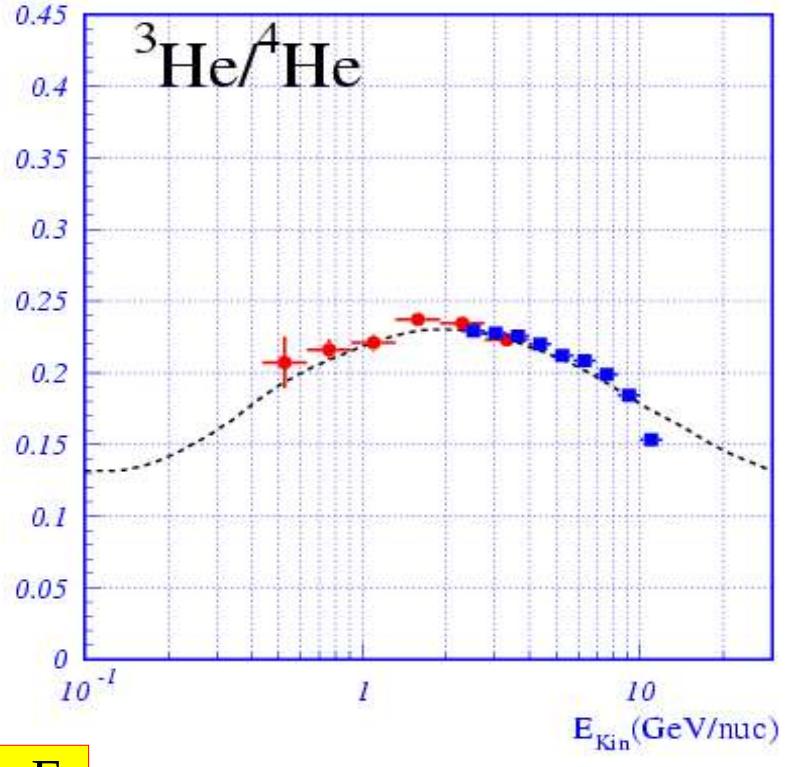
● AGL 1.03
AGL 1.05

Relative abundances: Helium

n = 1.03

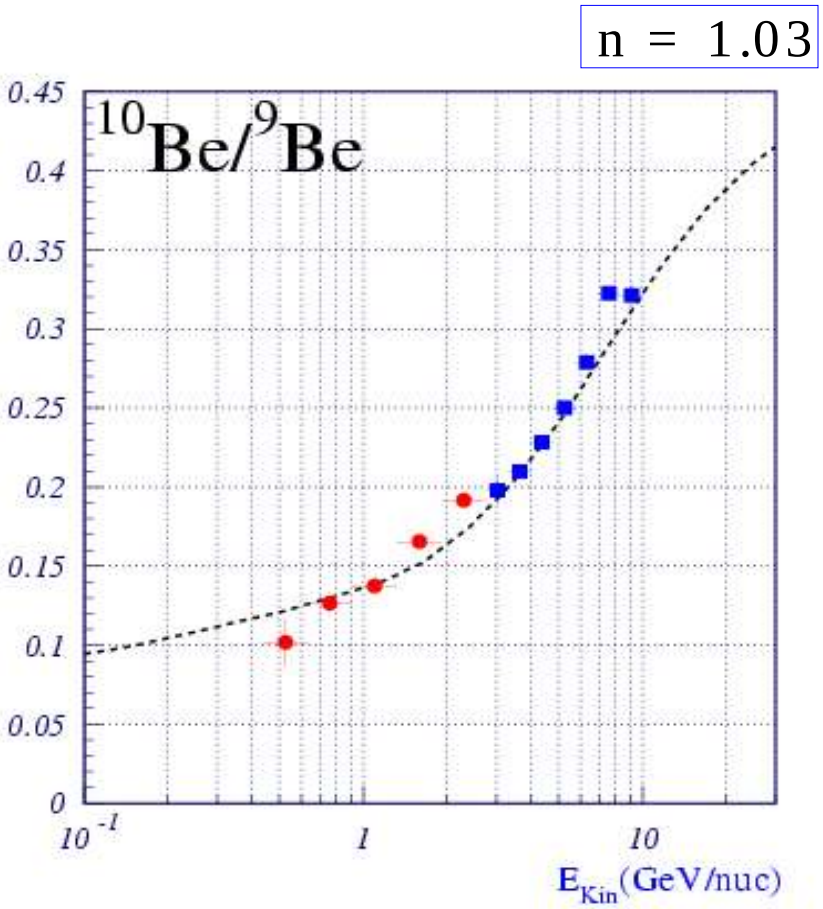


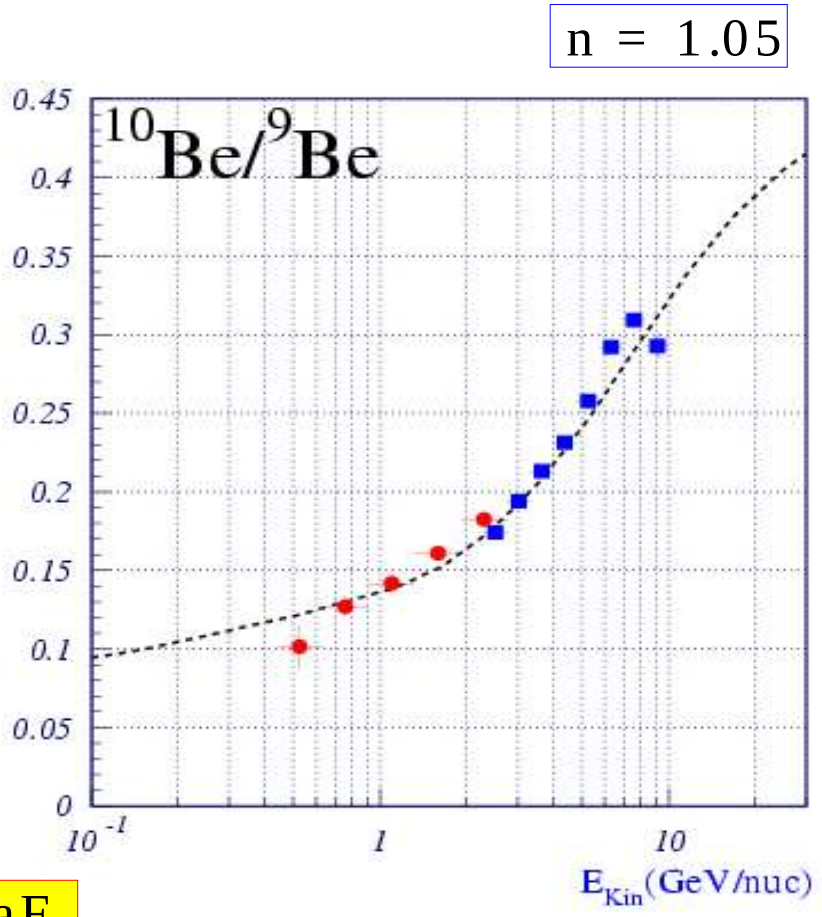
n = 1.05



NaF
AGL

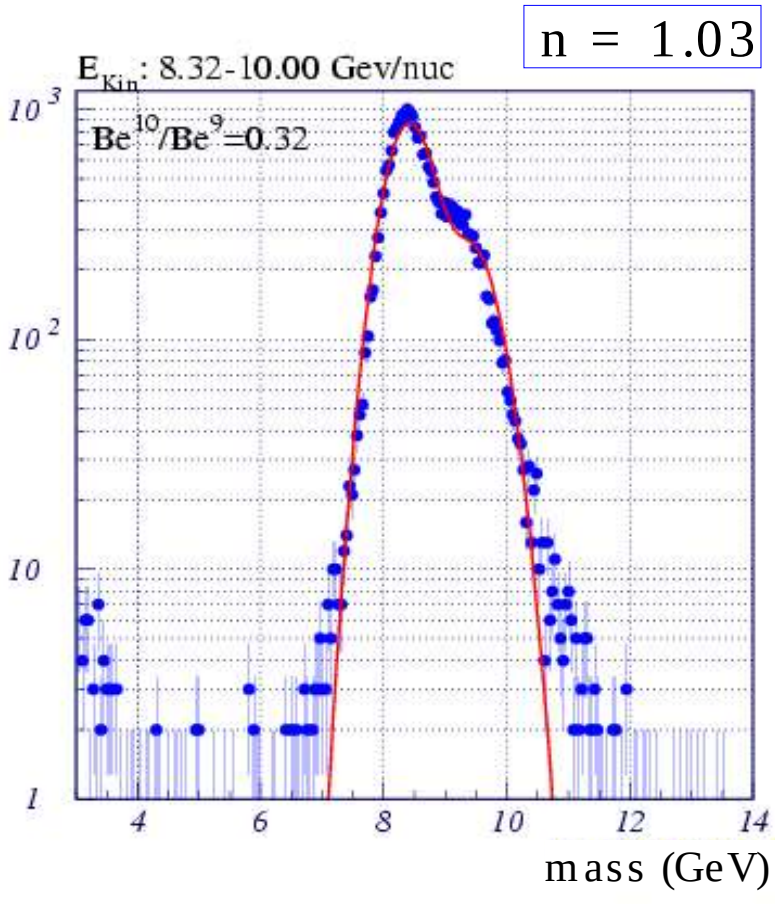
Relative abundances: Beryllium

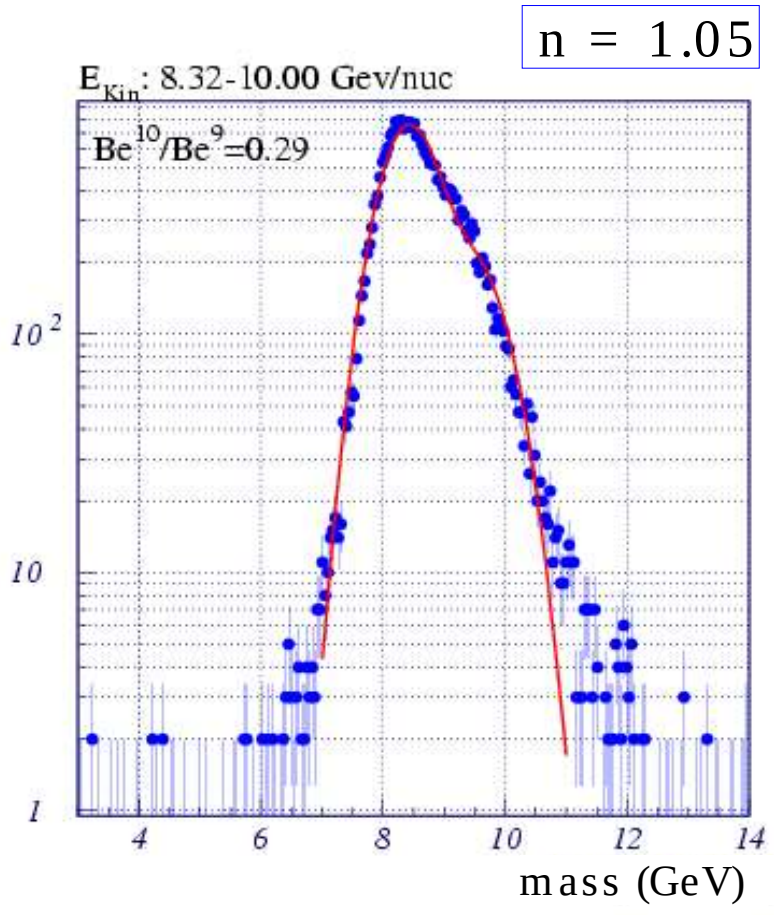




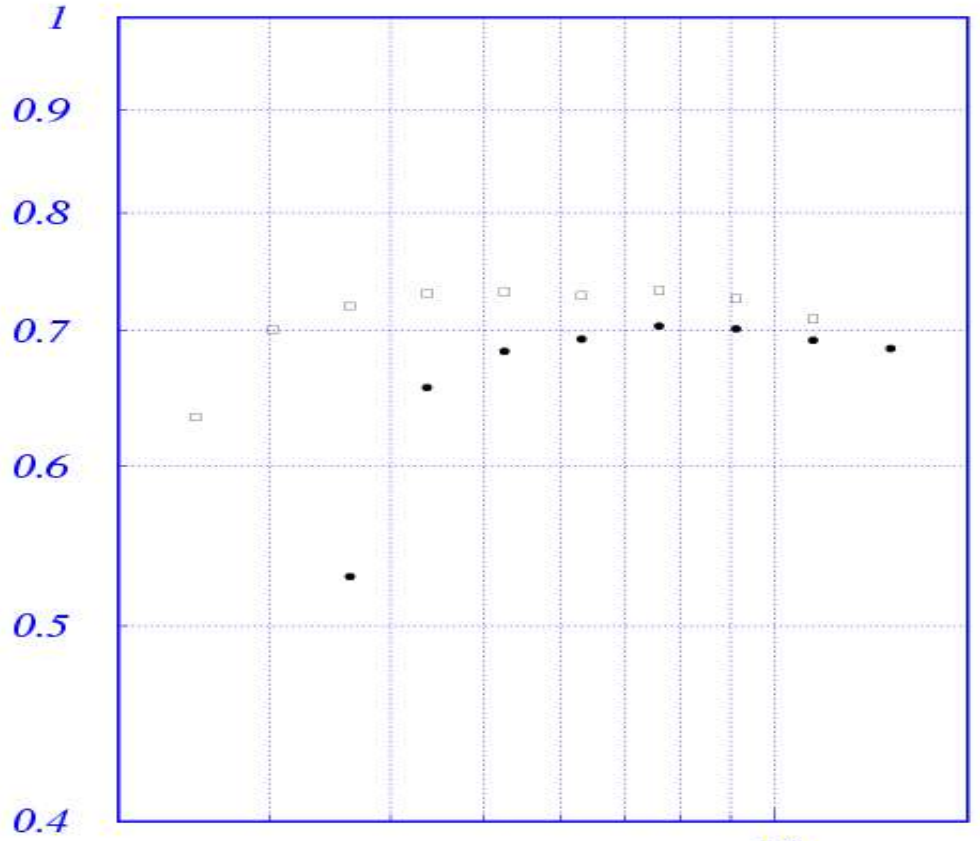
NaF
AGL

Mass resolution: Beryllium





Reconstruction efficiency: Helium



● AGL 1.03
AGL 1.05

Conclusions

- Results of Monte Carlo simulation of helium and beryllium isotopes were analyzed
- Higher reconstruction efficiency in AGL for n = 1.05
- Resuls in relative abundances are consistent with simulation starting data (better agreement in He than in Be)
- Difference at the last bin energy separation: AGL1.03 better than 1.05