Mizuche MC study
neutron study
(change FV)

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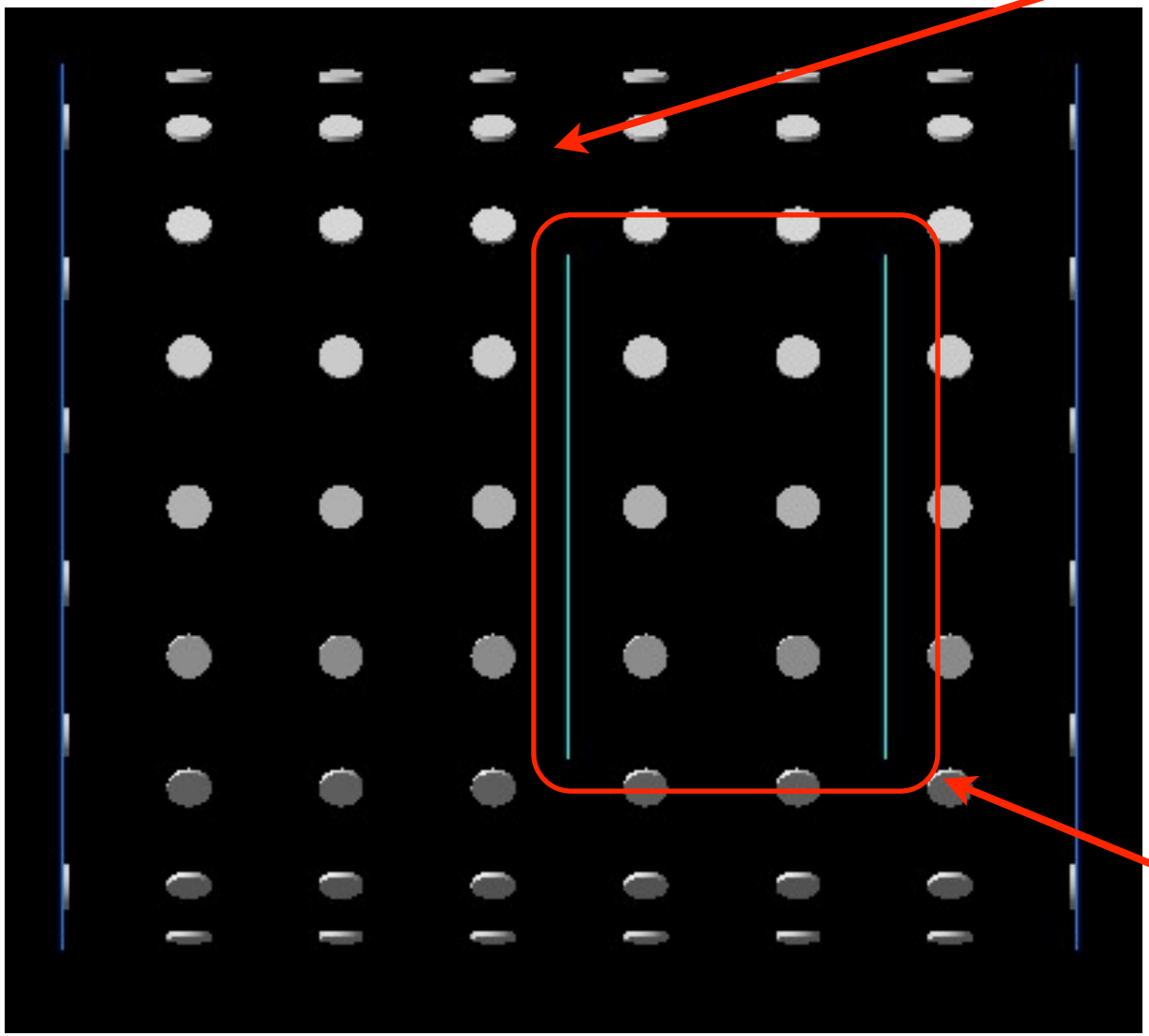
MC setting

- Neutron
  - kinetic energy : 0 ~ 1 GeV
  - vertex: 0,0,-90cm
  - direction : 0,0,1
- FVの半分の上流側を空気、下流側を水にする。



Tank

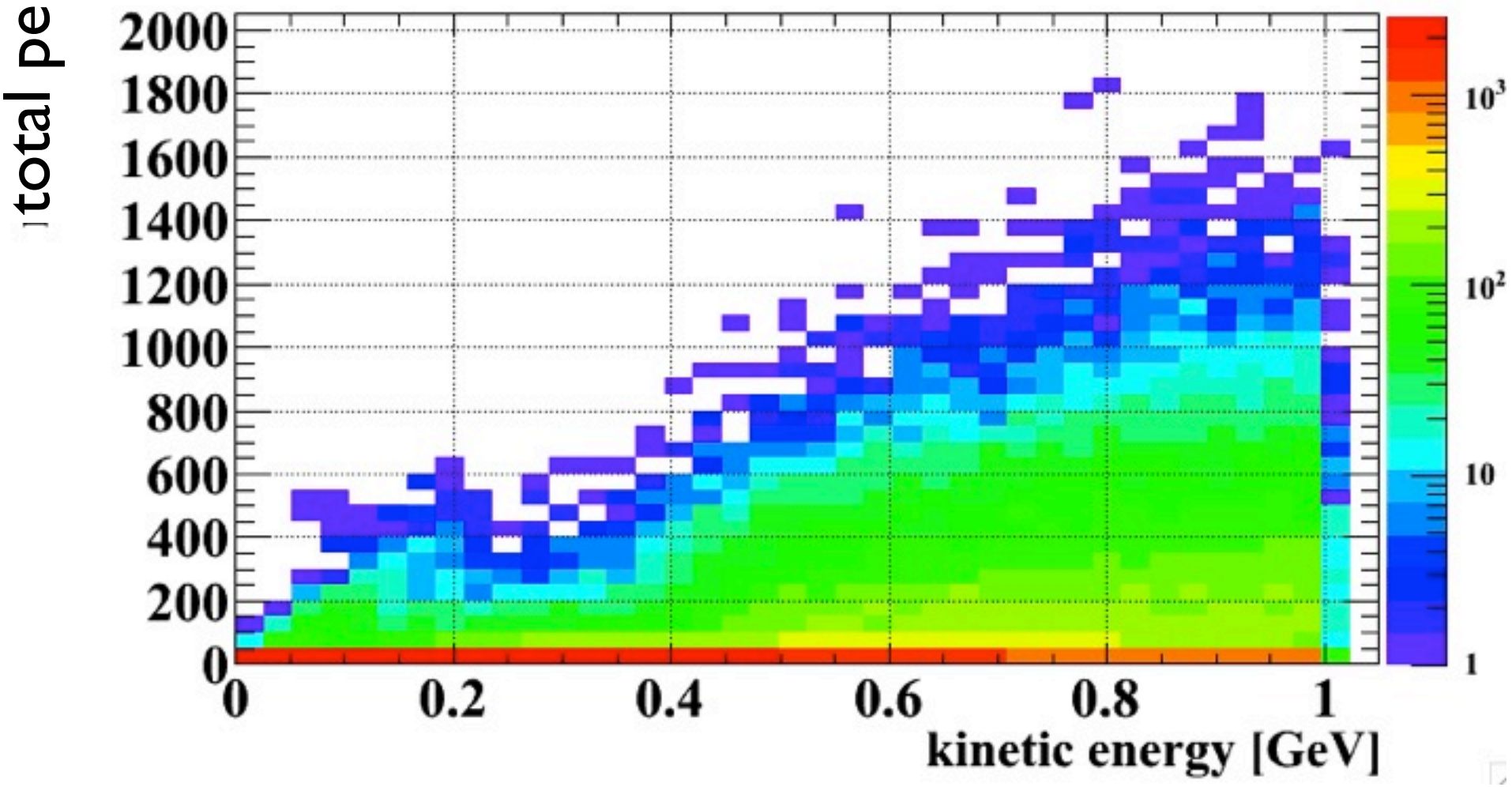
Tank内は水あり

beam

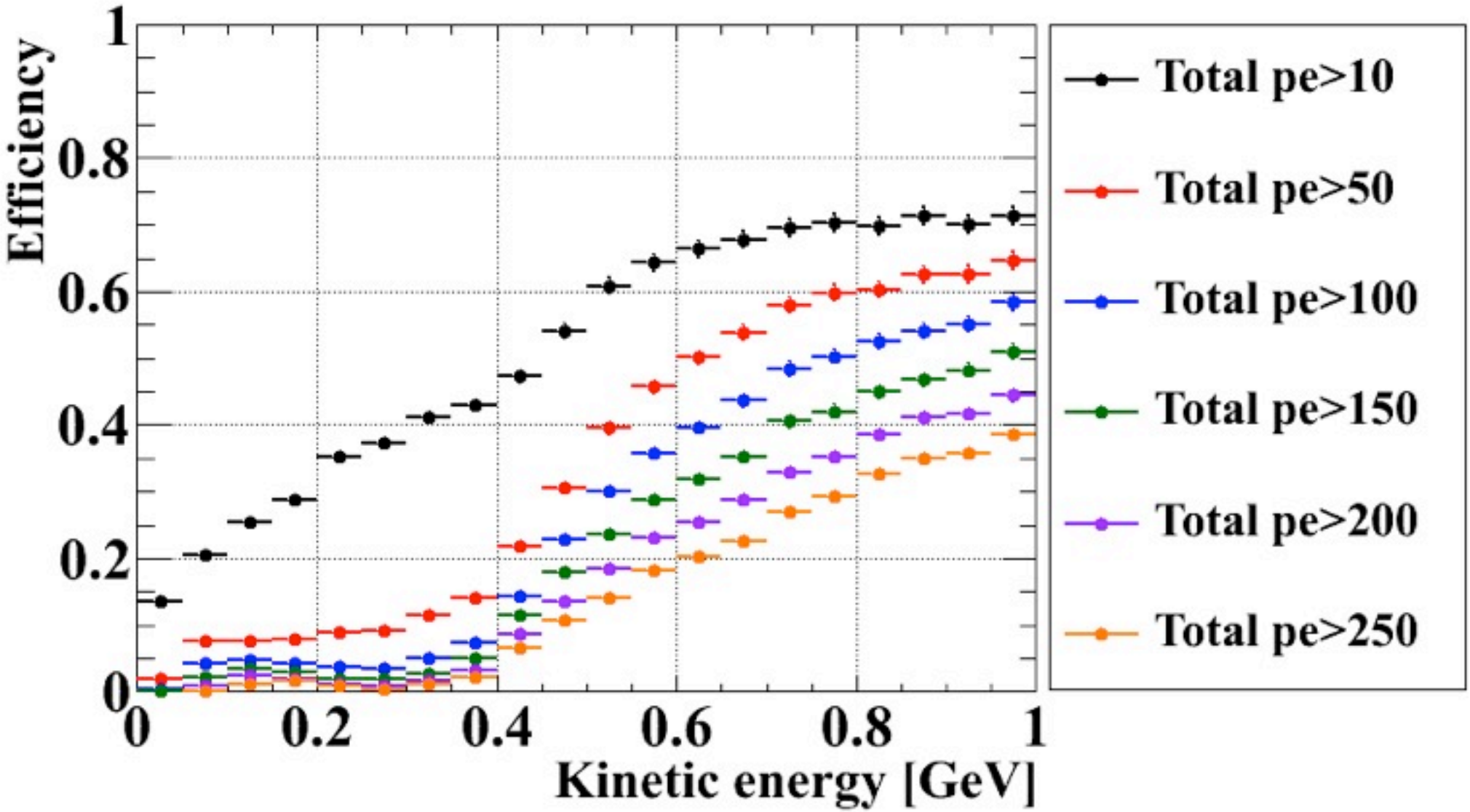
FV(半分)

このFVの水を抜く。

measured total p.e. vs kinetic energy



efficiency curve



vs # of muon

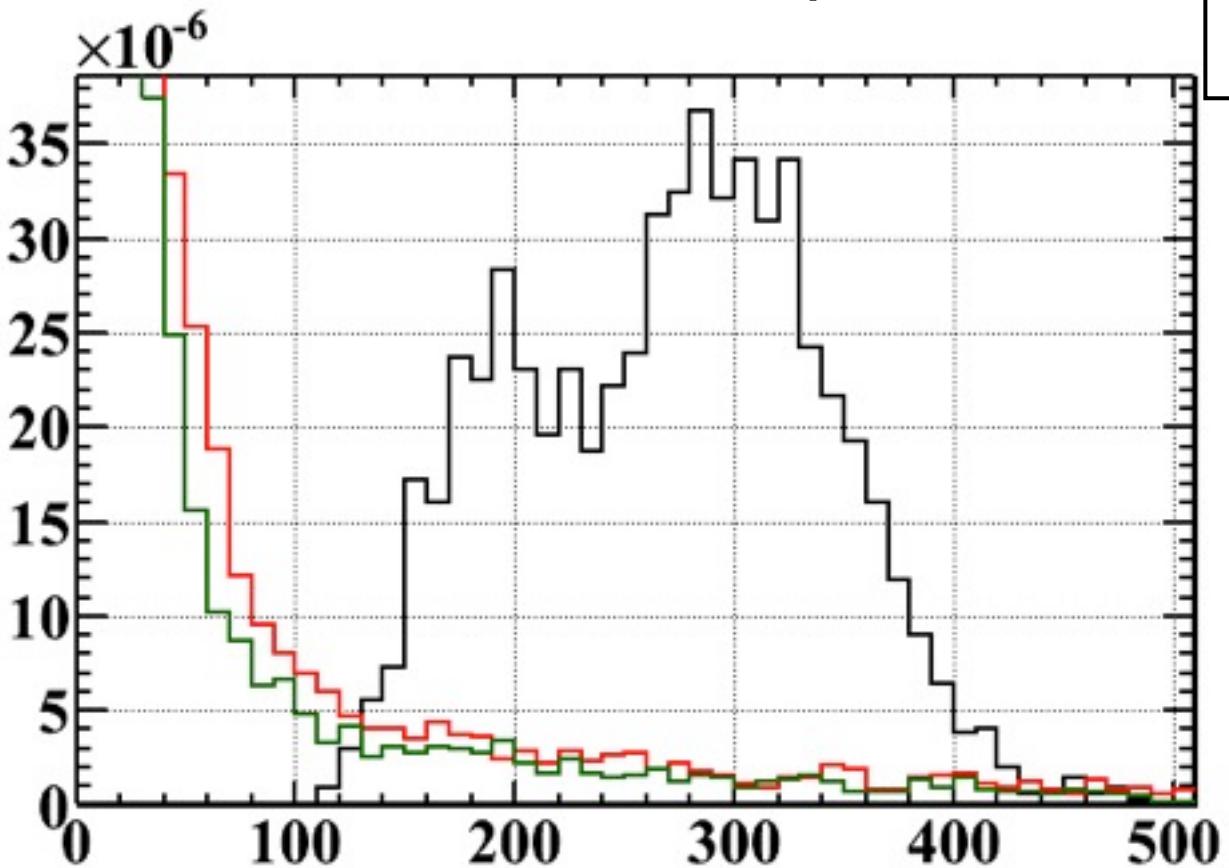
- 発表スライドのバックグラウンドスタディと同様のことを行う。

Background MC

Neutron interaction in Mizuche

- Inject neutron
  - Kinetic energy ~ 400 MeV
  - 6.6×10^{-4} neutrons/spill

muon generated in **half-FV**
- Kinetic energy : 150 MeV
- 0.615×10^{-3} particles/spill
  ~ # of CC int./spill



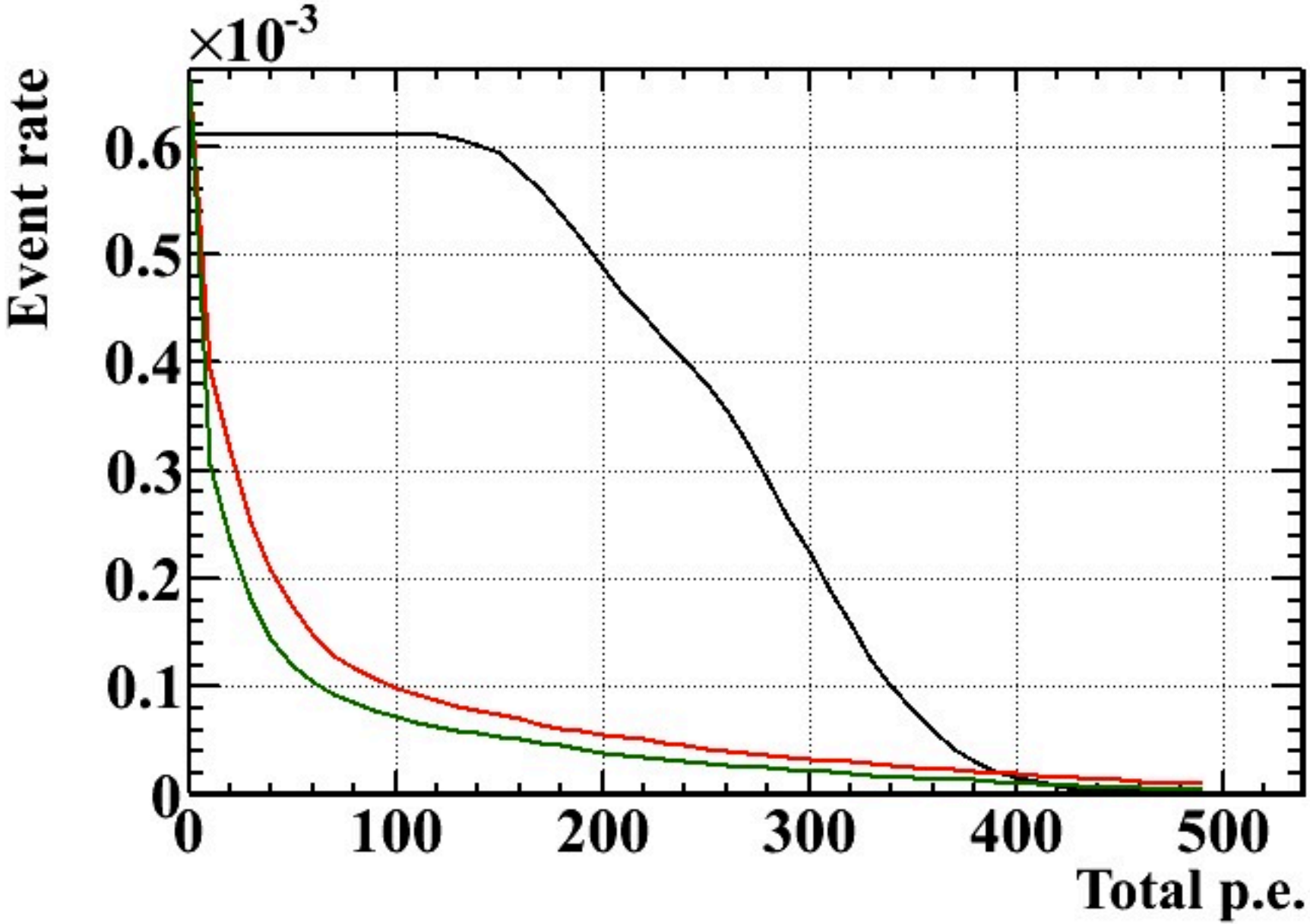
FVを半分にしたため、
反応数も半分にした

Muon generated in half-FV

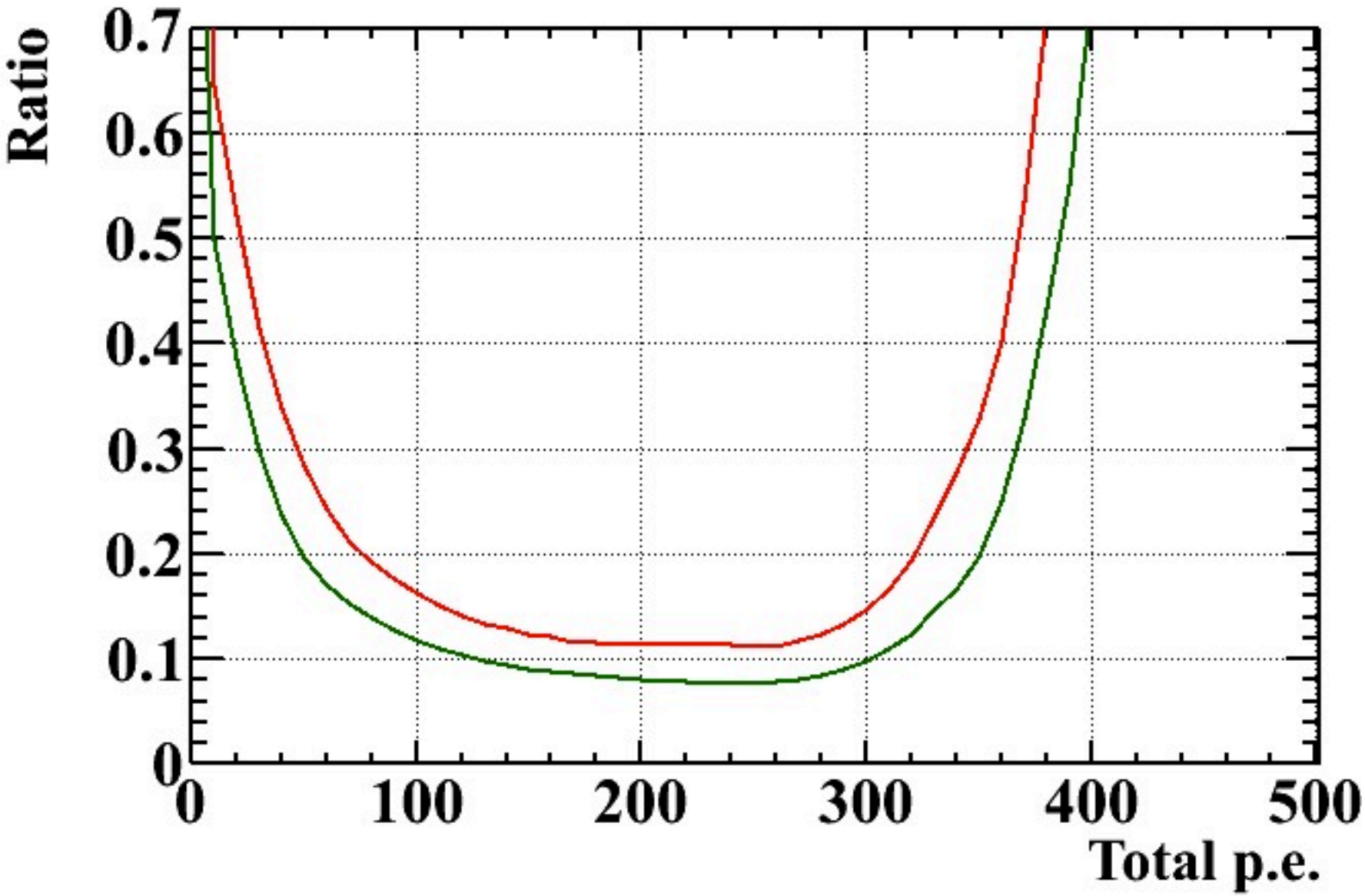
Neutron generated in Tank
(with water in FV)

Neutron generated in Tank
(without water in half-FV)

Event rate



Ratio



Total pe > 200の時

	Nobs	Ratio
muon in half-FV	4.87E-04	1
neutron(with water in FV)	5.58E-05	0.115
neutron(without water in half-FV)	3.90E-05	0.080
neutron(without water in FV)	1.98E-05	0.041

バックグラウンドの差し引き(half-FV内に水ありなし)：

5.58e-5 - 3.90e-5 = 1.68e-5 → 3.4% of # of muon in half-FV