Fractionation of $\text{O}_2$ and $\text{Ar}$ (Dome Fuji)

(a) Within the ice sheet

- Close-off fractionation
  - Size-dependent fractionation: **yes**
  - Mass-dependent fractionation: **yes**

- Homogenization
  - Slope ($\delta\text{O}_2/\text{N}_2$ vs. $\delta\text{Ar}/\text{N}_2$): 0.5

- Bubble-clathrate fractionation
  - Slope ($\delta\text{O}_2/\text{N}_2$ vs. $\delta\text{Ar}/\text{N}_2$): ~0.5 - 0.6
  - Slope ($\Delta\delta\text{O}_2/\text{N}_2$ vs. $\Delta\delta\text{Ar}/\text{N}_2$): ~0.9 - 1.0

- Clathrate hydrate
  - Size-dependent fractionation: **yes**
  - Mass-dependent fractionation: **not detected**
  - Remaining close-off fractionation
  - Diffusion by partial pressure difference between bubbles

- Homogenization
  - Slope ($\delta\text{O}_2/\text{N}_2$ vs. $\delta\text{Ar}/\text{N}_2$): 0.4

- No correlation ($\Delta\delta\text{O}_2/\text{N}_2$ vs. $\Delta\delta\text{Ar}/\text{N}_2$)

(b) Post-coring gas loss

- Slope ($\delta\text{O}_2/\text{N}_2$ vs. $\delta\text{Ar}/\text{N}_2$): 0.2
- Slope ($\Delta\delta\text{O}_2/\text{N}_2$ vs. $\Delta\delta\text{Ar}/\text{N}_2$): 0.2 (outer-inner)

- Size-dependent fractionation: **yes**
- Mass-dependent fractionation: **yes (strong)**