The Mars simulation chamber
Overview

- The chamber
- The experiment
- The individual experiment
- The calculations
The Mars simulation chamber
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Bacteria
The testing of bacteria
• Temperature
• UV exposure
• Humidity
• Atmospheric composition
• Pressure
RSL – Recurring Slope Lineae

- Signs of liquid water?
RSL – Recurring Slope Lineae

- Two experimental setups
- Setup – changing the angle
Estimating the ratio of the Earth's and Mars original atmosphere

- Under the assumption that the atmosphere was created either by outgassing or collision, where objects are from either the asteroid belt or Kuiper belt.

\[ Out \propto \left( \frac{r_{\text{Earth}}}{r_{\text{Mars}}} \right)^3 \]

\[ Col \propto \left( \frac{l_{\text{Earth}}}{l_{\text{Mars}}} \right)^2 \]

Where \( l \) is the radius of the effective area.

The ratio between Earth's and Mars original atmosphere if created by outgassing – 6.64

The ratio between Earth's and Mars original atmosphere if created by collision – 3.63 (asteroid belt) and 3.54 (Kuiper belt)
The estimated Martian atmosphere

- Estimating the mass of the atmosphere today (under the assumption that it has not changed).
- Mass of Earth's atmosphere: \(5.15 \times 10^{18} \text{ kg}\)
- Mars estimated atmosphere between \(7.76 \times 10^{17} \text{ kg}\) and \(1.45 \times 10^{18} \text{ kg}\)
- The actual Martian atmosphere is around \(2.5 \times 10^{16} \text{ kg}\)
- Calculating the difference and how long it would take to lose it. Loss rate \(1.5 \frac{\text{kg}}{s}\)
- Time between 15.8 – 30.1 Ga year