



Rb density vs heat exchanger temperature measurement

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Very preliminary!!!

The idea:

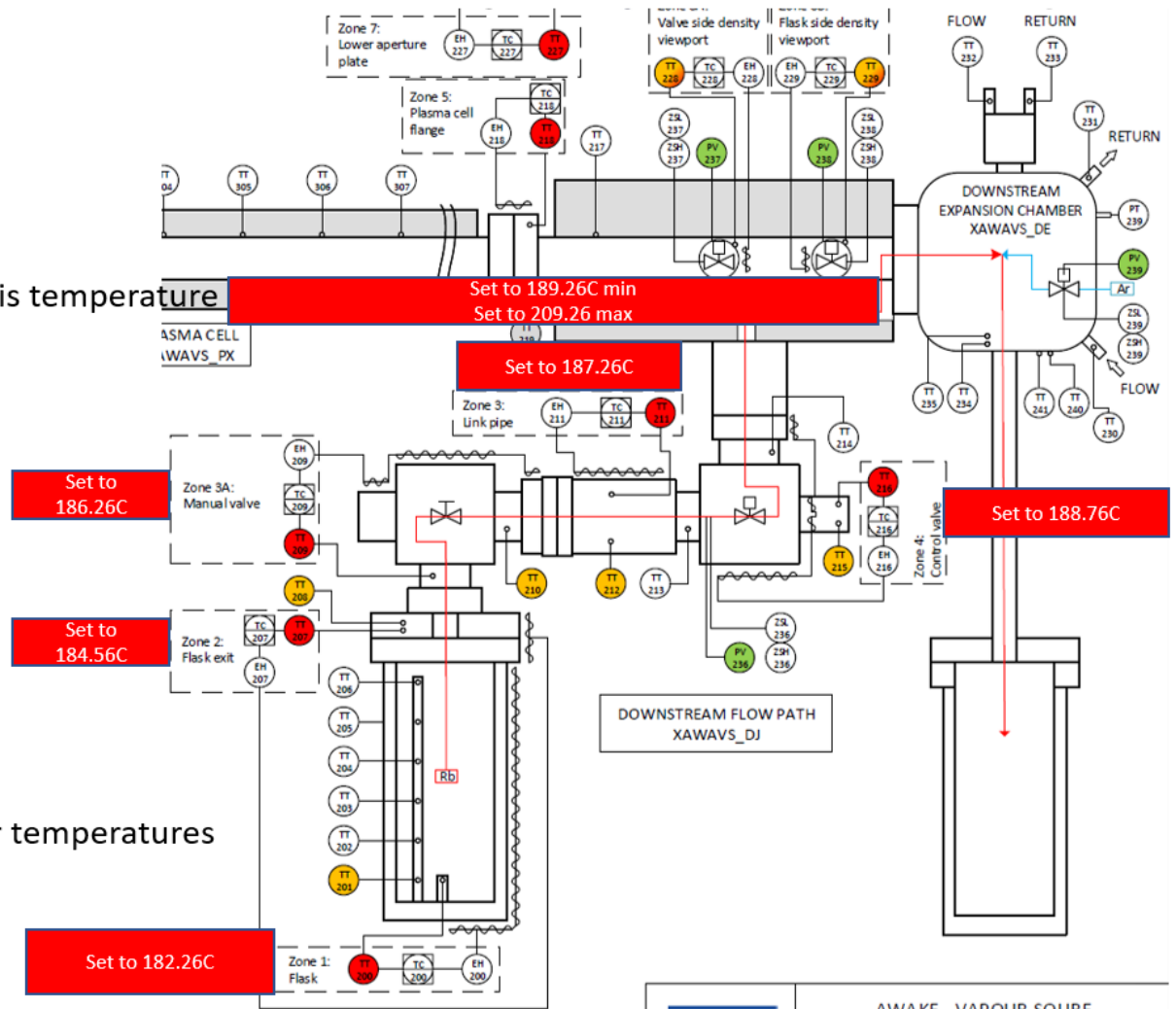
Only vary this temperature

Set to 189.26C min
Set to 209.26C max

Default: 15°C offset
First point: 7°

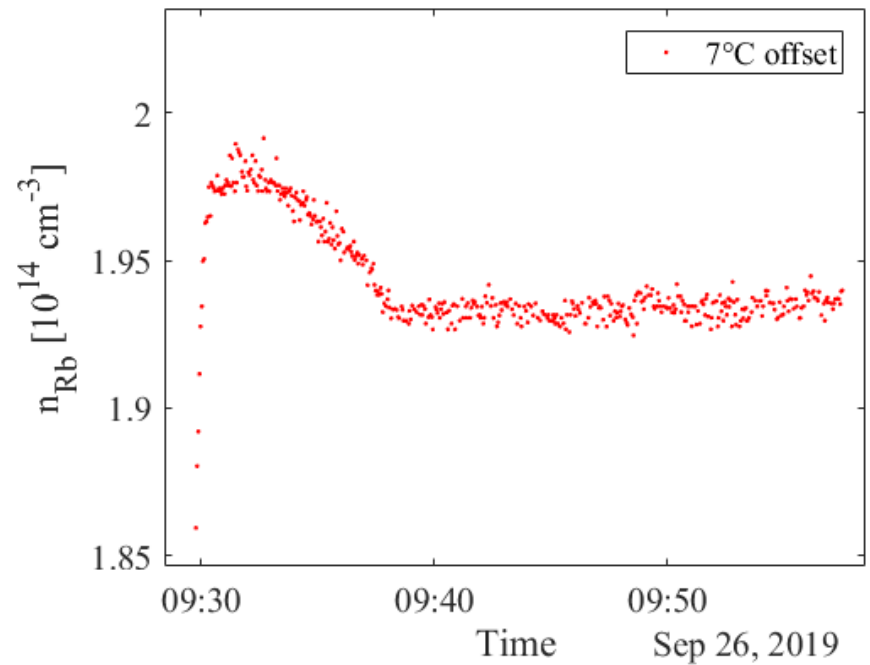
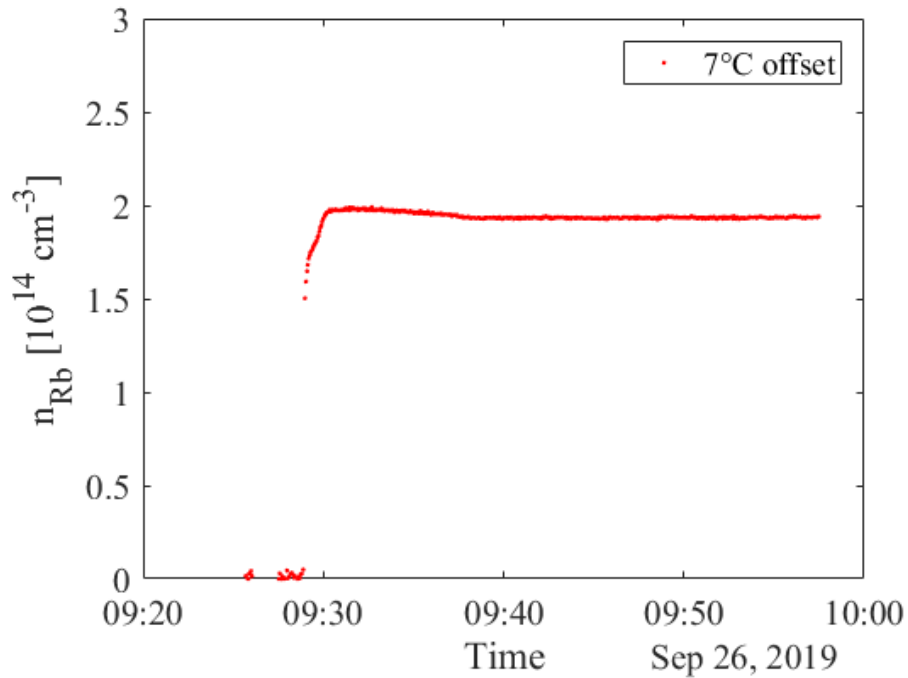
Changed the flow path!

Fix all other temperatures



First Data point (this morning)

Offset: 7°C



Data points (12:00)

Result for the Rb vapor density:

Measured:

@ 7°C offset: $(1.934 \pm 0.004) \times 10^{14} \text{ cm}^{-3}$

@ 11°C offset: $(1.952 \pm 0.003) \times 10^{14} \text{ cm}^{-3}$

@ 15°C offset: $(1.948 \pm 0.003) \times 10^{14} \text{ cm}^{-3}$

@ 19°C offset: $(1.928 \pm 0.004) \times 10^{14} \text{ cm}^{-3}$

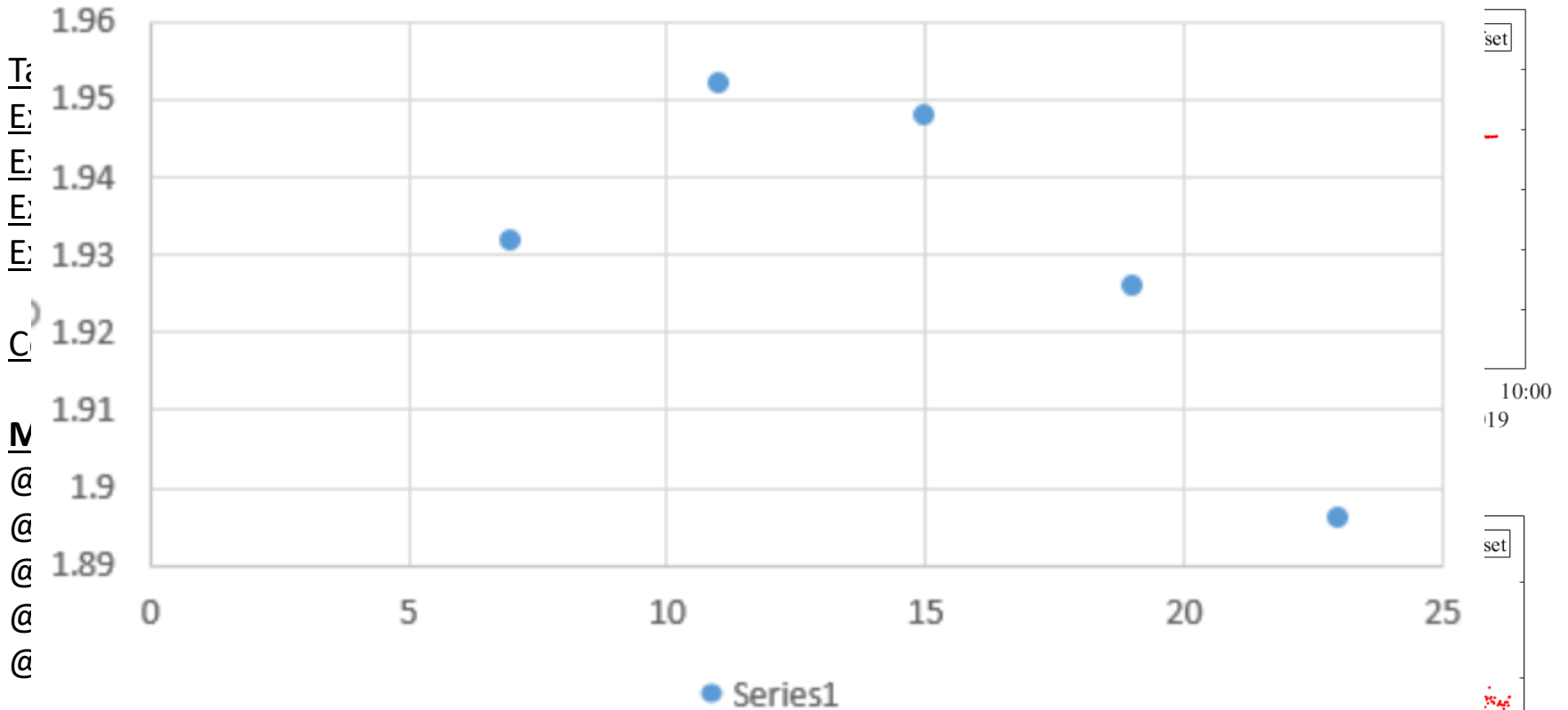
@ 23°C offset: $(1.896 \pm 0.005) \times 10^{14} \text{ cm}^{-3}$

A plot showing the Rb vapor density n_{Rb} in units of 10^{14} cm^{-3} versus Time on Sep 26, 2019. The y-axis ranges from 0 to 3, and the x-axis ranges from 09:20 to 10:00. The data points, marked with red dots, show a sharp increase from near zero at approximately 09:28 to a plateau of about 2.0 at 09:30, which remains stable until 10:00. A legend in the top right corner indicates '7°C offset'.

A zoomed-in plot showing the Rb vapor density n_{Rb} in units of 10^{14} cm^{-3} versus Time on Sep 26, 2019. The y-axis ranges from 1.85 to 2.0, and the x-axis ranges from 09:30 to 09:50. The data points, marked with red dots, show a peak of approximately 1.98 at 09:30, followed by a gradual decrease to a stable value of about 1.93 by 09:40, which remains constant until 09:50. A legend in the top right corner indicates '7°C offset'.

Data points (12:00)

Result for the Rb vapor density:



Difference: $0.018 \times 10^{14} \text{ cm}^{-3}$ for $\Delta T = 4^\circ\text{C}$

$$\Delta T/T = 4 / 462.4 = 0.865 \%$$

$$\Delta n_{Rb}/n_{Rb} = +0.018 / 1.934 = +0.931 \%$$

