



Supplement of

MULTICHARME: a modified Chernin-type multi-pass cell designed for IR and THz long-path absorption measurements in the CHARME atmospheric simulation chamber

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Figure S1. The 9 different ports of CHARME. Ports with letter (A) correspond to DN 450, (B) to DN 350 and (C) to DN 200.MULTICHARME was adapted to ports A1 and A2.



Figure S2. Field and objective mirrors of MULTICHARME with their mounts designed by the Anhui Institute of Optical and Fine Mechanics of Heifei, China



Figure S3. Arduino home-made control box connected to the 18 MULTICHARME actuators driving the field and objective mirror positions.



Figure S4. Different matrix arrangements of the He-Ne spots on the field mirrors of MULTICHARME. From left to right: 120 m (3 rows × 4 columns); 240 m (3 rows × 8 columns); 360 m (6 rows × 6 columns); 540 m (8 rows × 6 columns).



Figure S5. Post treatment to partially remove the baseline oscillations due to standing waves in MULTICHARME:

- First panel: Measured signal (black); Signal treated with a FFT filter (red); Baseline interpolated from the filtered signal (blue)
- Second panel: Absorbance calculated with the measured signal without FFT filter (black) and with FFT filter (red)
 - Third panel: Residual between the black and the red absorbances providing the LOD.