

## SUPPLEMENTARY INFORMATION

FOR

### Periodically Spaced CaF<sub>2</sub> Semi-Insulating Thin Ribbons Growth Study on the Si(100) Surface

Eric Duverger<sup>1</sup>, Damien Riedel<sup>2\*</sup>

<sup>1</sup>*Institut FEMTO-ST, Univ. Bourgogne Franche-Comté, CNRS, 15B avenue des Montboucons, F-25030 Besançon, France.*

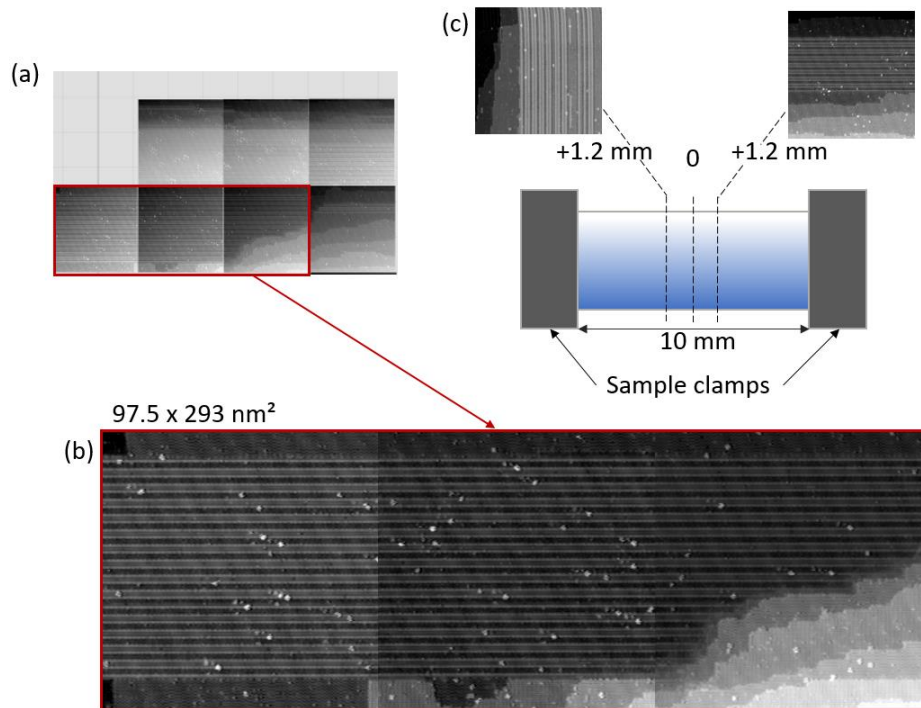
<sup>2</sup>*Institut des Sciences Moléculaires d'Orsay (ISMO), CNRS, Univ. Paris Sud, Université Paris-Saclay, F-91405 Orsay, France.*

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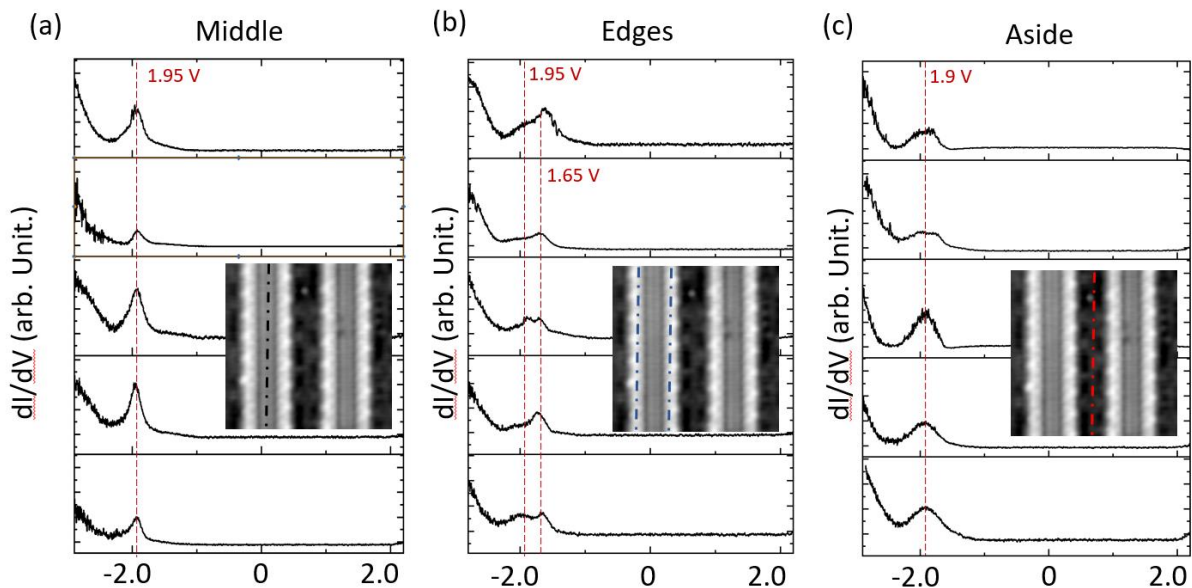
**Figure S1:** STM topographies at larger scale of the periodically spaced thin ribbons.

**Figure S2:** Evolution of the dI/dV signal along a thin ribbon for the three considered locations.

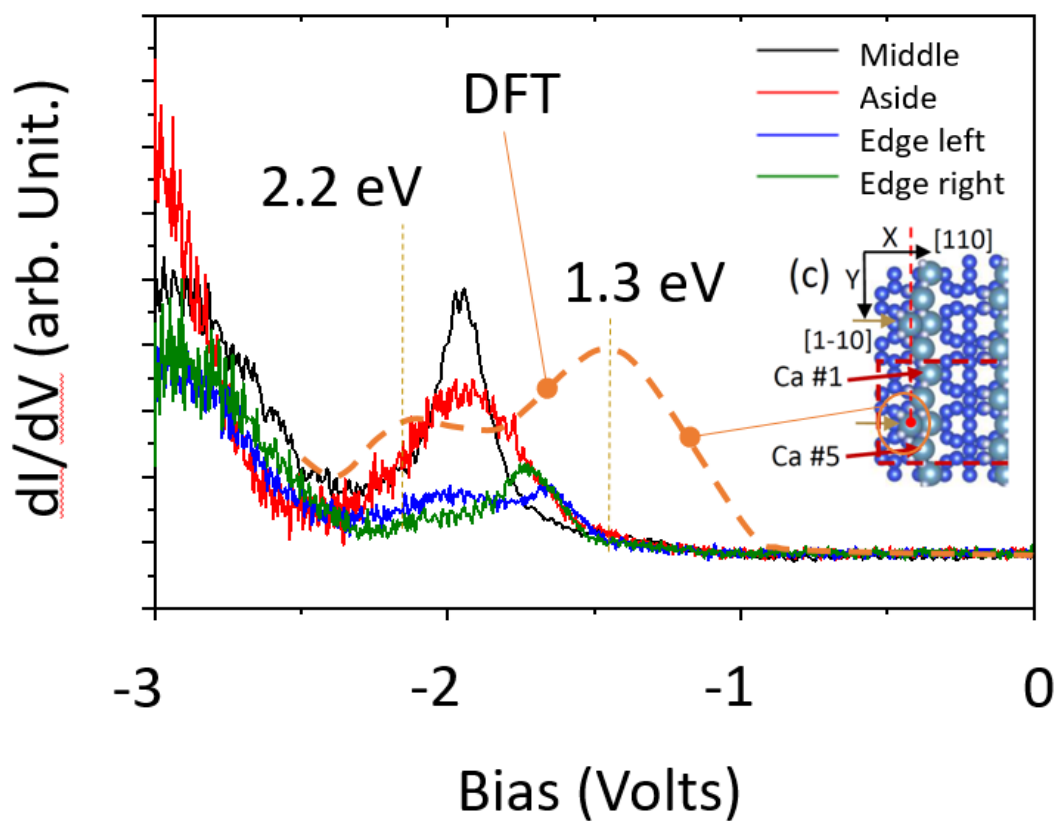
**Figure S3:** Comparison between dI/dV measurements and DFT PDOS calculations.



**Figure S1:** STM topographies at larger scale of the periodically spaced thin ribbons. (a) set of 7 STM images ( $93.5 \times 93.5 \text{ nm}$ ,  $-2.4 \text{ V}$ ,  $15 \text{ pA}$ ). (b) Zoom in of 3 consecutive STM images ( $93.5 \times 93.5 \text{ nm}$ ,  $-2.4 \text{ V}$ ,  $15 \text{ pA}$ ). (c) Extension of the periodically spaced thin ribbons structure on either side of the central part of the sample. The two STM topographies are acquired with the same conditions ( $93.5 \times 93.5 \text{ nm}$ ,  $-2.4 \text{ V}$ ,  $15 \text{ pA}$ ).



**Figure S2:** Evolution of the  $dI/dV$  signal along a thin ribbon for the three considered locations. (a) along the middle of the ribbon. (b) along the edges of the ribbon. (c) aside (or in between) two ribbons.



**Figure S3:** Comparison between  $dI/dV$  measurements and DFT PDOS calculations. The  $dI/dV$  curves acquired on the thin ribbon are compared with the projected density of states (PDOS) calculated on one of the additional  $\text{CaF}_2$  molecule (Ca #3) located along the edge of the thin ribbon. The PDOS curve (orange curve) exhibit two main peaks at energies 2.2 eV and 1.3 eV below the Fermi level. These peaks can be compared to the two  $dI/dV$  peaks observed at -1.6 V and -1.9 V.