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► To cite this version:

Apou Martial Kpemou, Marie-Christine Baietto, Jean Desquines, Tatiana Taurines, A Ambard, et al.. An experimental approach for the analytical study of secondary hydriding of fuel rods during a LOCA. NuMat2022: The Nuclear Materials Conference, Oct 2022, Ghent, Belgium. irsn-04040328

HAL Id: irsn-04040328

<https://irsn.hal.science/irsn-04040328>

Submitted on 22 Mar 2023

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AN EXPERIMENTAL APPROACH FOR THE ANALYTICAL STUDY OF **SECONDARY HYDRIDING** OF *M5_{Framatome} CLADDED FUEL RODS DURING A **LOCA**

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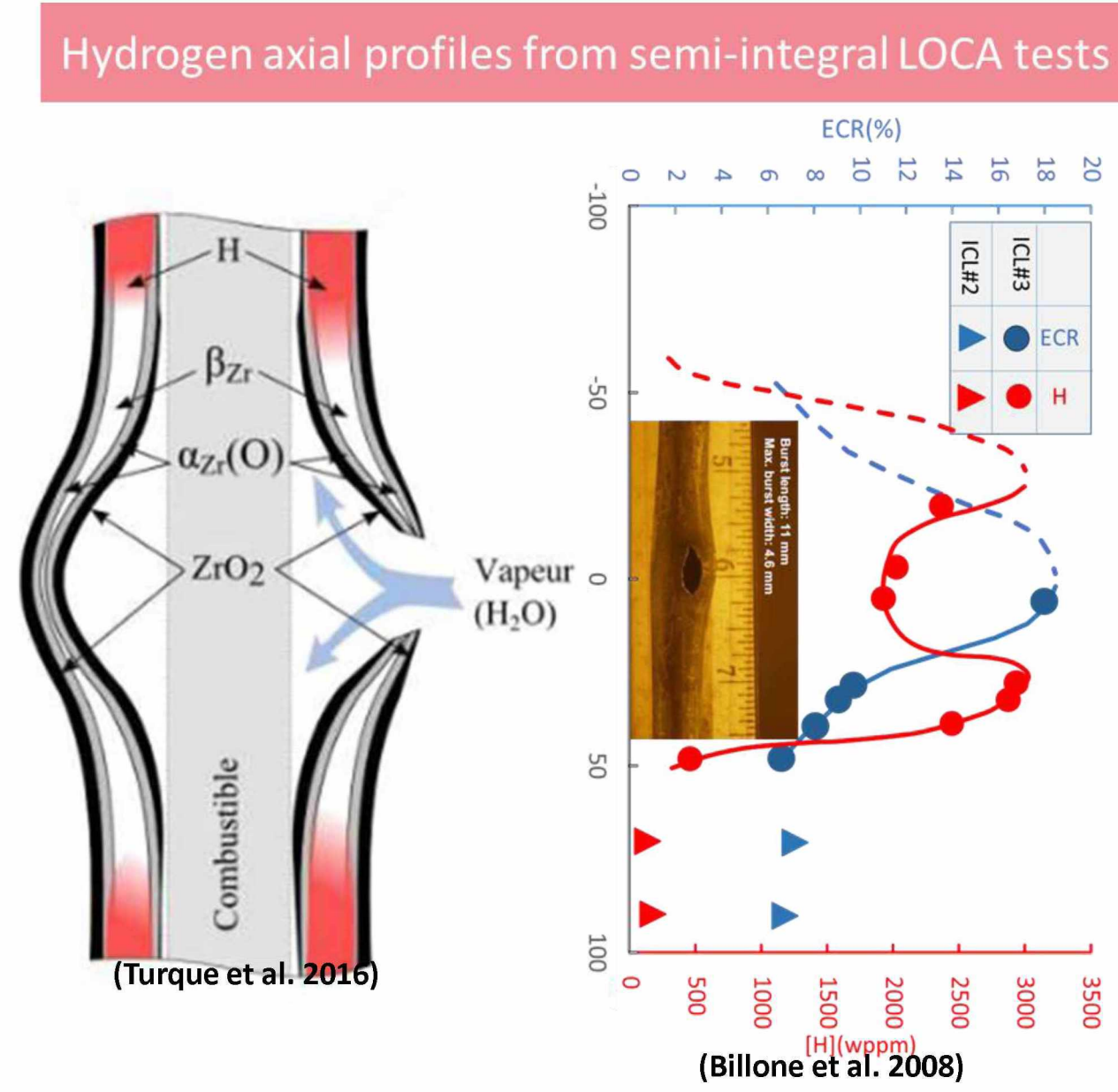
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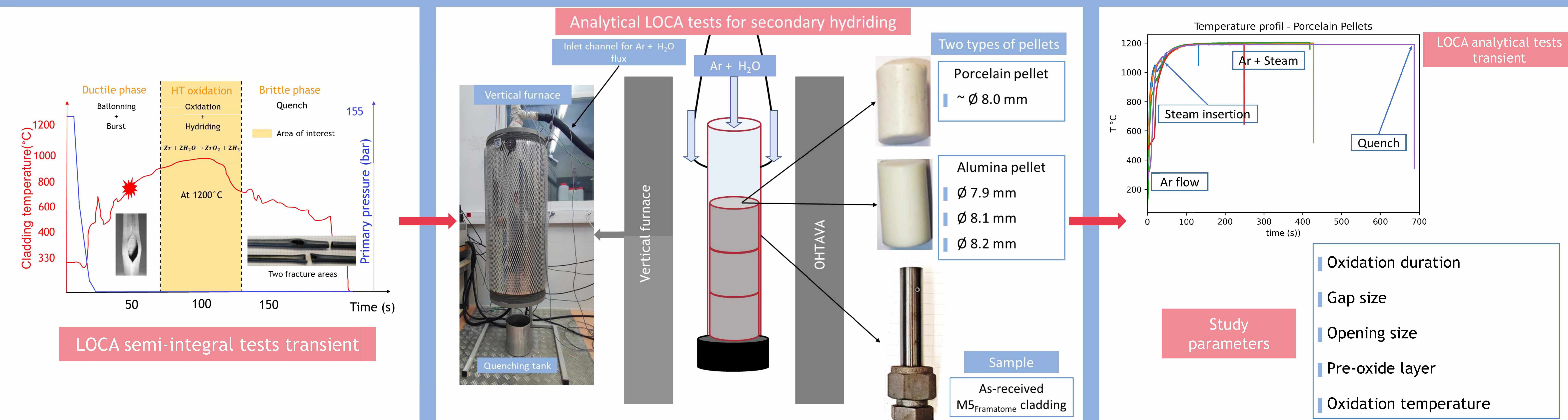
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ABSTRACT

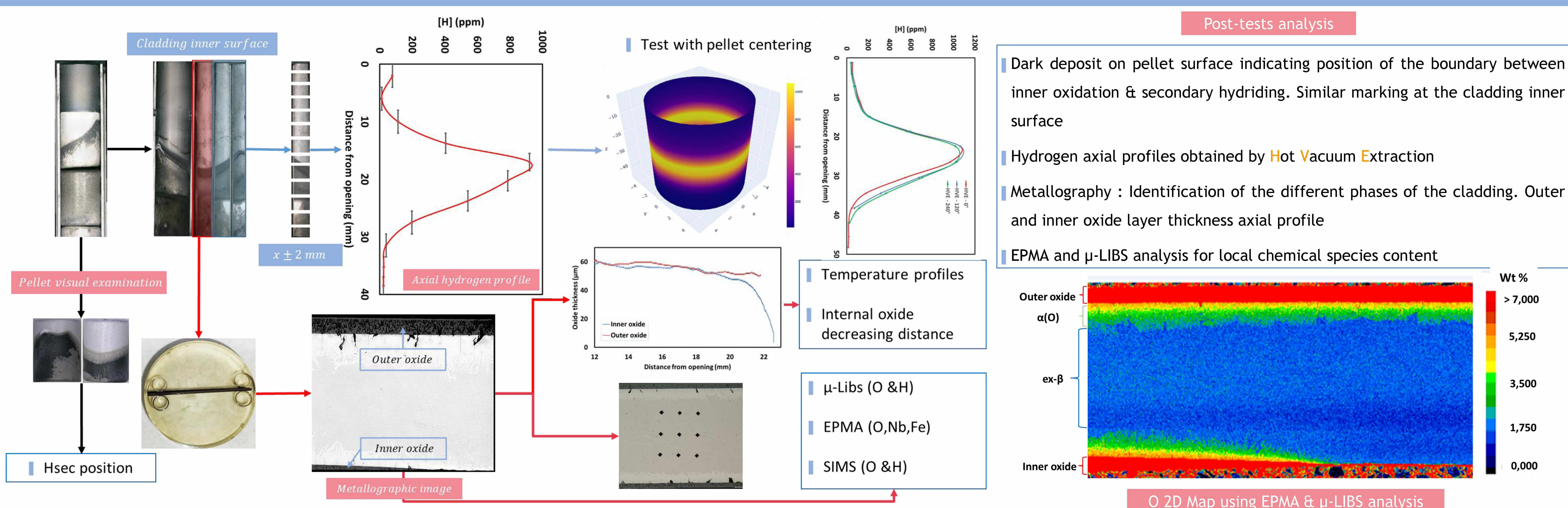
Secondary hydriding may occur in nuclear fuel cladding exposed to steam at high temperature in Loss of Coolant Accident (LOCA) conditions. During a LOCA transient, the cladding may burst, and the steam ingress into the cladding results in inner surface oxidation in the vicinity of the burst region. A high hydrogen uptake can then occur near the burst position, leading to localized **hydrogen peak concentration in the cladding** : this is known as secondary hydriding (Hsec). The aim of this project is to **improve the understanding of this phenomenon**. Burst opening and gap size, oxidation duration and other parameters influences are characterized using an axisymmetric testing procedure reproducing LOCA conditions including oxidation and final quench on *M5_{Framatome} cladding.



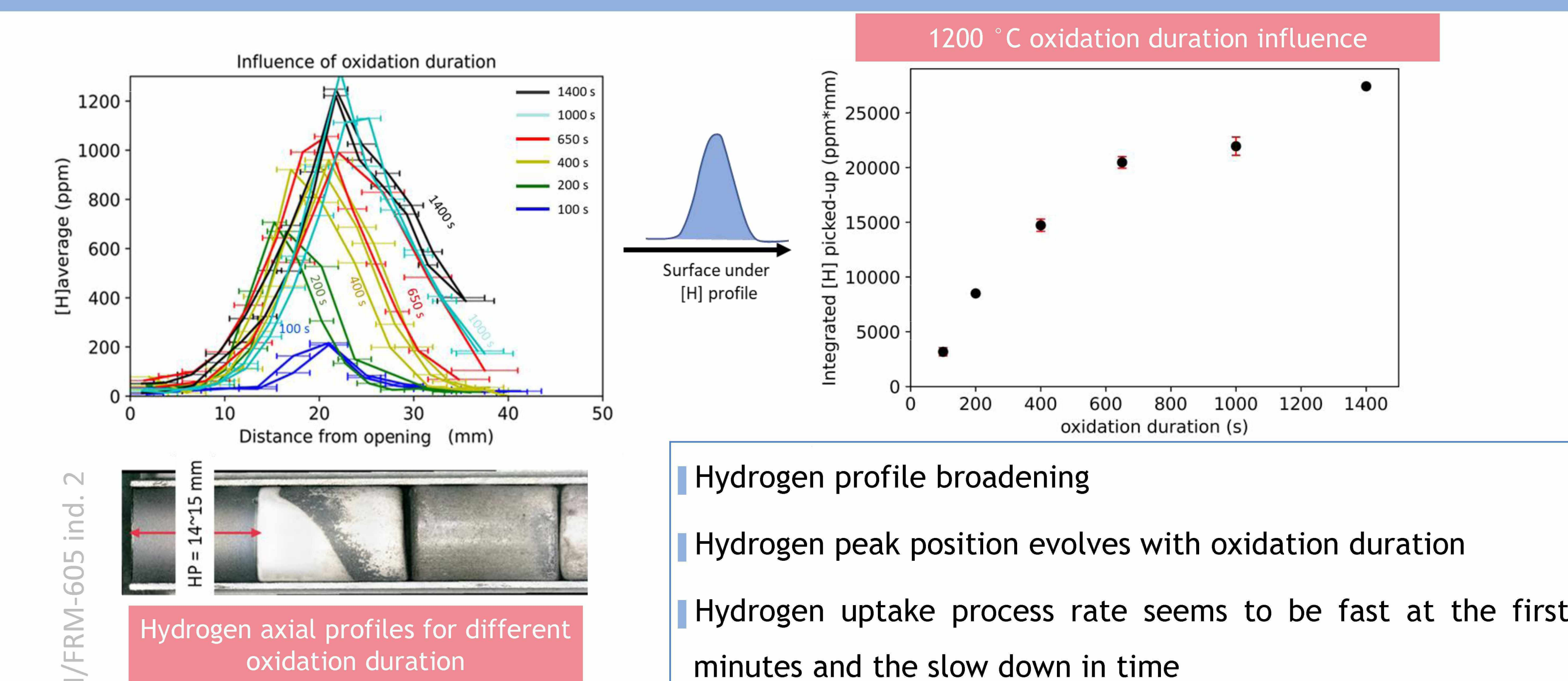
ANALYTICAL LOCA TESTS - METHODS



ANALYSIS METHODS



PRELIMINARY RESULTS



CONCLUSIONS - PERSPECTIVES

- Analytical tests allow secondary hydriding parametric studies during HT oxidation under steam environment.
- The longer the oxidation duration is, the higher the hydrogen uptake is with a decreasing rate.
- The study of gap size, pre-oxide layer, opening size and oxidation temperature influence is under progress.
- Semi-integral segmented tests (creep ballooning then HT oxidation) are planned.