despite that its computational burden is slightly increased. On the other hand, in [11], an LQR controller has been experimentally tested considering the same plant and control objectives. Results show a suitable response when the system is close to the considered operating point, but its performance cannot be theoretically guaranteed in other working conditions.

V. Conclusions

An LPV gain scheduled control strategy has been proposed to regulate the oxygen stoichiometry of a PEMFC. A precise control of this variable is needed to ensure an efficient conversion and avoid irreversible damages in the polymeric membrane. Special attention has been paid to the implementation aspects. To this end, an LPV AW compensation has been introduced in order to mitigate the negative effects of the saturation of the control action. In addition, both in the LPV controller and in the AW compensator, pole placement constraints have been considered to guarantee a proper implementation in industrial computers. The complete control strategy has been implemented in an experimental platform and evaluated in several practical scenarios. In all cases, the proposed control has exhibited promising results.

Acknowledgements

All the experimental tests were performed at the Fuel Cells Laboratory of the Institut de Robòtica i Informàtica Industrial (CSIC-UPC, Barcelona, Spain) and only possible due to its advanced equipment and proficient technical staff.

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