

Fig. 30 THD of stator current for the IVC-PWM control (RT).

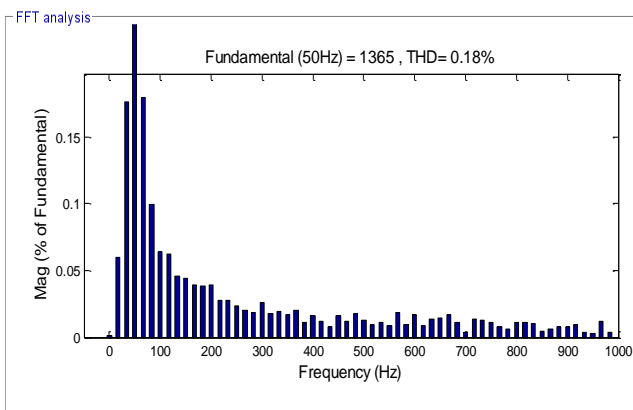
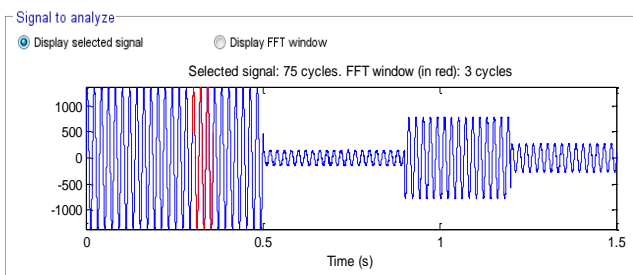


Fig. 31 THD of stator current for the NSOSMC-ANFIS-SVM control (RT).

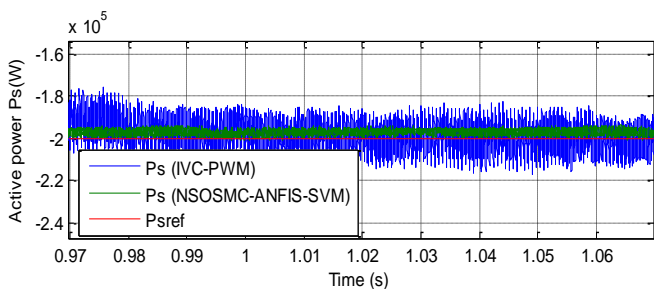


Fig. 32 Zoom in the active power (RT).

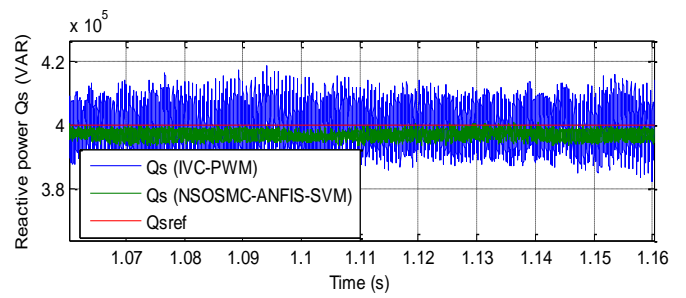


Fig. 33 Zoom in the reactive power (RT).

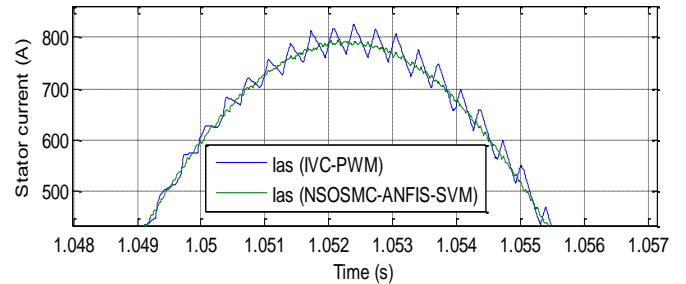


Fig. 34 Zoom in the stator current (RT).

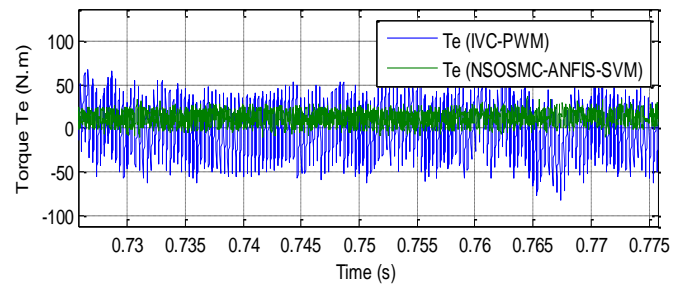


Fig. 35 Zoom in the electromagnetic torque (RT).

## VIII. CONCLUSION

A novel robust strategy based on variable structure method of a DFIG has been presented in this article. The DFIG connected directly to the grid by the stator and fed by an ANFIS-SVM strategy on the rotor side. Our objective was the simulation of a neural second order sliding mode control technique with ANFIS-SVM technique of stator active and stator reactive powers generated by the stator side of the DFIG in order to ensure high performances of the DFIG machine and make the system insensible with the external disturbances and the parametric variations. Simulation results have confirmed that the proposed NSOSMC-ANFIS-SVM operates with a very lower ripples power and reduced of the THD value of stator current in term of tracking and robustness test. Basing on all these results it can be concluded that robust strategy as NSOSMC-ANFIS-SVM can be a very good-looking result for the strategy using DFIG such as wind energy transfer systems.

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