



Fig.14 Efficiency curve map according to speed.

load, thus load condition is controlled by the produced torque of induction motor driven with PWM inverter. Experimental results and analysis one are compared as shown Fig. 12, Fig. 13 and Fig. 14, where full-load voltage and current curves are given in steady state. The comparison shows that the amplitude and curvatures are in good agreement, except at some peak values. The map of efficiency of machine at the whole operation range is above 80%. At rated load, the efficiency is 88.2% and total loss is 384 W.

5 Conclusion

This paper deals with the development of AFPMG for a direct drive wind energy system. The design dimension, construction and experimental results of 3kW, 240rpm AFPMG are presented. In the design process of AFPMG, characteristics was carried out by 3D FEM and the thermal field analysis was computed by the CFD method. Based on the analytical design approach, a 3kW prototype generator is constructed. The electrical performance values for the proposed model are then compared with experimentally measured quantities to evaluate the effectiveness of the analytical design approach.

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