



Figure 16. Voltage, current and current spectrum after filtering

6.4 Interpretation of results

The previous figures show:

- The improvement of the shape of the source currents after filtering.
- The fuzzy hysteresis technique improves the performance of the network compared to the fixed hysteresis strategy.
- The fuzzy hysteresis technique control has a good filtering quality.
- The decrease in fuzzy hysteresis band's gain (from $\Delta h=1$ to $\Delta h=0.1A$) has allowed us to have more sinusoidal network currents.

7. CONCLUSION

The Power quality management has been the main problem that the industries are facing today. This is mainly affected by generation of harmonics. The growing use of electronic equipment produces a large amount of the harmonics in the distribution systems because of non-sinusoidal currents consumed by non-linear loads. In this paper and we clearly calculate the Total Harmonic distribution (THD) with shunt active power filter and without shunt active power filter. In this work, we have shown the effectiveness of Hysteresis and fuzzy controllers for harmonics mitigation using shunt APF. It

is clearly understood that by using Hysteresis controller the harmonics level dropped to 2.08 % from 17.8 % when shunt APF is not connected, which is well below the restrictions imposed by IEEE Std. 519. In case of fuzzy logic controller, the THD was approx. 1.8%.

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