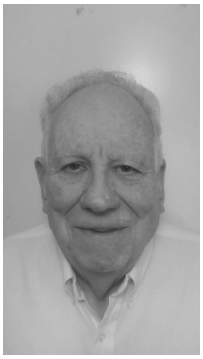
Electrochemical Immittance and Transfer-function Spectroscopy applied to LENR



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CR-39 solid state nuclear track detectors have detected the emission of high energy particles from active LENR electrodes and liquid scintillation detectors have detected the generation of tritium. Linear Energy Transfer (LET) curves in water for ionizing radiation indicate that such radiation will propagate considerably further than the double layer thickness produced during electrolysis. This suggests that the electrical characteristics of an active LENR electrode during codeposition, loading and operation will exhibit different properties when observed in real time via Electrochemical Immittance Spectroscopy (EIS). These changes could be an indication of the active electrode properties such as effective porous surface area, diffusion/mass transport level and LENR activity.

We have developed an EIS capability which is incorporated into our real time multichannel instrumentation system that allows continuous observation, data reduction, and recording of EIS data. Both frequency-domain and time-domain digital electrochemical immittance and transfer-function spectroscopy will be discussed. Explicit as well as implicit frequency diversity systems will be examined considering, implementation and performance as well as cost. The presentation will include a discussion of the EIS system design and implementation as well as a summary of our findings.