

**Contribution:** Poster presentation at the XXIX International Evoked Response Audiometry Study Group (IERASG-2025) Biennial Symposium, Boulder, Colorado, EEUU (June 14-18, 2025)

**Title:** Reduction of the power line interference in a single-channel AEP recording system based on low cost consumer electronics: application for dissemination of audiology concepts in schools and at a science museum.

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**Topics:** ABR; MLR/ALR

**Keywords:** Power line interference (PLI), biopotential recording system, auditory evoked potentials (AEP).

#### **ABSTRACT:**

**Background:** In IERASG-2023 we presented an AEP recording system mostly based on consumer electronics. It was based on a PLI reduction procedure, requiring the simultaneous acquisition of the differential and common-mode signals and applying appropriate signal processing in a statistical framework. It presents the inconvenience of requiring specific hardware for extracting the common-mode signal and a recording system with at least two input channels.

**Methods:** We present an advanced procedure for PLI reduction using only the differential signal. The procedure analyzes the recorded signal and implements an efficient subtraction of the PLI without the need of any specific hardware. With this procedure, the recording system is even simpler (and cheaper) than the previous approach, making it appropriate for education purposes. Based on this new conception, we have designed a dissemination workshop with demo activities, oriented to primary and high schools, to introduce basic concepts of audiology and AEPs. This workshop will be carried out in the spring-2025 in several schools and at Granada science museum (Parque de las Ciencias).

**Results:** The performance of the proposed procedure is evaluated in terms of the reduction of the PLI and quality improvement in AEPs, including ABR/MLR/ALR, recorded in different out-of-laboratory scenarios. The activities carried out in the workshop (including ECG analysis, EMG description and AEPs recordings using different stimulation patterns) are presented.

**Conclusions:** We describe a robust, flexible, low-cost and open AEP recording system appropriate for research, education and dissemination purposes, with an example of a workshop for dissemination of audiology concepts.