POSTER ABSTRACTS

urations (earplugs, earmuffs, dual protection). Statistical analyses of the measured data are performed to investigate the effect of various factors on the occlusion effect, such as: type of excitation, and attenuation levels. Results are presented and discussed, particularly in relation with the development of a single-number index to characterize the occlusion effect.

Noise Protection of the Communication Earplug (CEP) with a Custom Earplug Tip and the HGU-56/P Flight Helmet

Presenter: JR Stefanson, BS
United States Army Aeromedical Research Laboratory

Co-Presenter: William A. Ahroon, PhD

Hazardous noise environments, such as in Army aviation, often require the use of personal protective equipment (e.g., earplugs, helmets). While aviators need adequate hearing protection, they also need to be able to communicate. For this reason Army aviators are currently issued communications earplugs (CEP) with their flight helmet. The CEP provides the hearing protection of an expandable-foam earplug while passing a clear radio communication signal to the ear. The CEP may also be combined with a custom-molded earplug tip that is specifically made to fit a user's ears. While the use of custom hearing protection has become more prevalent in the armed forces, there is no Army Airworthiness Release (AWR) for using custom CEP earplug tips. Thus, aviators are not currently permitted to use them without a waiver. For this study, twenty volunteers were recruited to evaluate the protection of custom CEP ear tips. Real-ear attenuation at threshold (REAT) measurements were conducted according to the American National Standard Methods for Measuring the Real-Ear Attenuation of Hearing Protectors S.12.6-2016, Method A: trained-subject fit procedure. REAT measurements were made for all volunteers with the custom CEP ear tips and coupled with the HGU-56/P flight helmet. REAT measurements were also made with expandable foam CEP ear tips. Preliminary results suggest custom CEP ear tips offer comparable attenuation as foam CEP ear tips.

Earcanal Sizing: What Does Your Little Finger Tell You?

Presenter: Jeremie Voix
École de technologie supérieure

Co-Author Not Presenting: Guilhem Viallet

The human earcanal remains mostly an uncharted territory: earcanal shapes and dimensions are unique to each individual and despite recent advances in 3D scanning, the capture of the earcanal's exact geometry remains challenging. Nevertheless, the proper selection of an intra-aural hearing protector often requires that the earcanal size be estimated. Therefore, several tools -such as earcanal and concha gages- have been developed over the years to quickly and approximately assess one's earcanal dimensions and recommend the appropriately matching earplug size. In this anthropometric study, sparked by the lexical similarity in French between the noun for the little finger (auriculaire) and the adjective related to aural parts (auriculaire), we explore whether Nature did not provide a suitable earcanal sizing tool... at the tip of our fingers. The results from a recent pilot study will be presented together with possible field applications for hearing protectors and a selection of in-ear wearables.