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EARLY-TIME HEMP CONDUCTED ENVIRONMENT

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The design of protection schemes for military and civilian infrastructure against High Altitude Electromagnetic Pulses (HEMP) requires testing the efficiency of the installed protection devices. The test must reproduce the high current levels induced on overhead lines when exposed to the expected impinging fields. Extensive work was performed several decades ago in the US and the IEC SC 77C to calculate the electromagnetic environment produced by HEMP. Several standards have been issued to define the testing parameters of the protection devices. In this talk, we investigate the accuracy of past results by revisiting the calculations using advanced techniques. Understanding the work methodology and predicting the HEMP-conducted environment is paramount to properly planning electromagnetic protection.

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Nicolas Mora (M'07 - SM '18) received a B. S. degree in Electronics Engineering in 2007, and a M.Sc. degree in Electrical Engineering with a major in High Voltage Engineering in 2009, both from the National University of Colombia. He joined the EMC Research Group of the National University of Colombia in 2007. In 2009 he joined the EMC Lab at the Swiss Federal Institute of Technology (EPFL). He received his Ph. D degree in Electrical Engineering from EPFL in 2016. From 2015 to 2019 he worked as an R & D Engineer for montena technology. In 2020 he joined the Directed Energy Research Center of the Technology Innovation Institute in Abu Dhabi, where he was the Senior Director of Electromagnetic Effects. In 2023 he joined the Research and Extension Directorate of the National University of Colombia. In 2011, he received the Frank Gunther Award of the Radio Club of America and the Young Scientist Award from URSI. From 2013-2016, he was the president of the Colombian Association of Researchers in Switzerland. In 2015 he received the Young Scientist Award from the Summa Foundation. He was appointed as a Distinguished Reviewer of the IEEE Transactions on Electromagnetic Compatibility in 2015, 2016, 2018, 2019, and 2020. He was the chair of the joint EMC / AP / MTT chapter of IEEE in Switzerland between 2016 and 2019. In 2016, he received the Best Paper Award from the EMC Europe 2016 Wroclaw Symposium. In 2018, he received the HPEM Fellow award from the Summa Foundation, and in 2019 the Motohisa Kanda Most Cited IEEE Transactions in EMC Paper Award. Since 2021 he has served as Associate Editor of the IEEE Letters on Electromagnetic Compatibility Practice and Application. Since 2022 he has been an Associate Editor of the IEEE Transactions on Electromagnetic Compatibility. He was elected IEEE EMC Distinguished Lecturer for the period 2022-2023. In 2023 he joined the Board of Directors of the IEEE EMC Society as a representative of R9.