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Observation of warm-hot intergalactic medium in OVII and OVIII absorption against diffuse extended sources with Athena and LEM

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The physical properties of the faint and extremely tenuous plasma in the filaments of the cosmic web remain one of the biggest unknowns in our story of large-scale structure evolution. The most common techniques how to observe this medium are either in emission, or in absorption against very bright, point-like sources. In this talk I focus on the warm-hot intergalactic medium and present yet another technique, which can be explored for now only in theory and with simulations, but it might serve as a complementary tool to explore the properties of the cosmic web with upcoming future X-ray missions. I will present how the cosmic web filaments, simulated with the cosmological hydrodynamical simulations Hydrangea, look like in OVII and OVIII absorption against diffuse extended sources, in particular relaxed, nearby, massive cool core galaxy clusters. I simulate the observations with Athena X-IFU and LEM, while taking into account the absorption from our Galaxy, and report on the significance of the detection of WHIM in OVII and OVIII. I discuss the lower limit on the column densities that can still be observed with these instruments and provide a guide of where to look for WHIM on the sky.

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