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Radar Detection of ultra high energy cosmic rays ABAZ KRYE-MADHI, Messiah College, Grantham PA, USA, MICHAEL BAKUNOV, University of Nizhny Novgorod, Nizhny Novgorod Russia, ALEX MASLOV, Tucson AZ USA, ALINA NOVOKOVSKAYA, University of Nizhny Novgorod, Nizhny Novgorod Russia — We revisit the radar echo technique as an approach to detect ultra high energy cosmic rays (UHECR). The UHECR extensive air showers produce disk-like ionization fronts propagating with a relativistic speed and creating fast decaying plasma. We study the reflection of a radio wave, such as the one from a radar transmitter or commercial radio and TV station, from the ionization front. The reflected wave will be frequency up-shifted due to relativistic Doppler effect. The amplitude of the reflected wave depends strongly on velocity of the front, and density and collision frequency of the plasma behind it. The returned power will be shown for typical extensive air shower parameters.

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