Deconvolution method to improve altitude resolution for ISR observations

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Uncoded long pulses are widely used in the incoherent scattering radar experiments and routine observations. But the results usually give poor altitude resolution, because the range ambiguity function of long pulse is in proportion to pulse width. We present a signal processing method which is anticipated to promote altitude resolution of uncoded long pulse. The method is based on deconvolution principle. We consider the radar echoes as convolution of transmitted pulse and the ionospheric electron density. Simulations demonstrate that the processing technique is able to improve altitude resolution in some degree. Verifications using radar data are implementing. The application criteria and scope of this method should be carefully analysed. After proving its usability, the technique may be applied to meteors and Naturally Enhanced Ion Acoustic Lines (NEIALs) observations, and so on.