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Title:	Evidence for ultra-fast outflows in radio-quiet AGNs: II - detailed photo-ionization modeling of Fe K-shell absorption lines
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Abstract

X-ray absorption line spectroscopy has recently shown evidence for previously unknown Ultra-fast Outflows (UFOs) in radio-quiet AGNs. In the previous paper of this series we defined UFOs as those absorbers with an outflow velocity higher than 10,000km/s and assessed the statistical significance of the associated blueshifted FeK absorption lines in a large sample of 42 local radio-quiet AGNs observed with XMM-Newton. In the present paper we report a detailed curve of growth analysis and directly model the FeK absorbers with the Xstar photo-ionization code. We confirm that the frequency of sources in the radio-quiet sample showing UFOs is >35%. The outflow velocity distribution spans from \sim10,000km/s (\sim0.03c) up to \sim100,000km/s (\sim0.3c), with a peak and mean value of \sim42,000km/s (\sim0.14c). The ionization parameter is very high and in the range log\xi 3-6erg s^{-1} cm, with a mean value of log\xi 4.2 erg s^{-1} cm. The associated column densities are also large, in the range N_H\sim10^{22}-10^{24} cm^{-2}, with a mean value of N_H\sim10^{23} cm^{-2}. We discuss and estimate how selection effects, such as those related to the limited instrumental sensitivity at energies above 7keV, may hamper the detection of even higher velocities and higher ionization absorbers. We argue that, overall, these results point to the presence of extremely ionized and possibly almost Compton thick outflowing material in the innermost regions of AGNs. This also suggests that UFOs may potentially play a significant role in the expected cosmological feedback from AGNs and their study can provide important clues on the connection between accretion disks, winds and jets.

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