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K-shell Photoioinization of the atomic nitrogen and oxygen isonuclear sequences[1]

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The advent of third and fourth generation light sources, such as the ALS at Berkeley, USA, SOLEIL in Orsay, France and PETRA III in Hamburg, Germany, this past decade or more and the unprecedented high brightness and spectral resolution have made it possible to perform detailed cross section measurements in the X-ray region of extremely important astrophysical elements such as Carbon, Nitrogen and Oxygen and their isonuclear sequences [1,2,3]. In tandem with this world wide experimental endeavour theoretical work has provided interpretation in unravelling and identifying prominent resonance features in the spectra in the vicinity of the K-shell region. For the atomic oxygen sequence (K_α and K_β resonance positions in the vicinity of the K-edge) we note that ground based measurements (ALS and SOLEIL) and R-matrix with pseudo-states (RMPS) theoretical results are in agreement [3,4] but are ≈ 0.5 eV in discrepancy with satellite observations from CHANDRA and XMM-NEWTON [5,6]. A review of the current status of experiment, theory and observation will be presented for the various sequences.

1. A. Müller *et al* PRL 114 013002 (2015).

2. M.M. Sant'Anna *et al* PRL **107** 033001 (2011).

3. B.M. McLaughlin *et al* ApJL 771 L8 (2013).

4. J.-M. Bizau al PRA **92** 023401 (2015).

5. T.W. Gorczyca *et al* ApJ **779** 78 (2013).

6. E. Gatuzz *et al* ApJ **780** 80 (2013), ApJ **790** 131 (2014).

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