E2 AND M1 TRANSITION PROBABILITIES IN IONS OF THE NITROGEN ISOELECTRONIC SEQUENCE CALCULATED USING MBPT

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Forbidden electric quadrupole *(E2)* and magnetic dipole *(M1)* transitions are of extreme importance in astrophysics. Up to now the most extensive calculations for the nitrogen isoelectronic sequence have been done using the method proposed by C.J. Zeippen [1] or in MCHF approximation [2]. To account for electron correlations both these methods use a large list of configurations. We have chosen the stationary many-body perturbation theory (MBPT) [3] for the inclusion of the electron correlations. The calculations have been perfomed in the second order in the complete model space $1s^2 2s^2 2p^3 + 1s^2 2p^5$. Relativistic corrections have been accounted for in the Breit-Pauli approximation. In the Table we present probabilities for electric quadrupole *W(E2)* and magnetic dipole *W(M1)* transitions (in s^{-1}), wavelengths λ (in A). The comparision of the results shows that our second order calculation data in the most cases are closer to term-energy corrected ones from [1].

$1s^2 2s^2 2p^3$ ($^4S_{3/2} - {}^2D_{3/2}$)		MBPT		MCHF [2]	Recommended [1]
		First order	Second order		
O II	*W(E2)*	4.30-5	2.11-5	1.88-5	2.36-5
	W(M1)	1.66-4	1.20-4	1.31-4	1.29-4
	λ	3329.1	3821.1	3569.7	3727.1*
Ne IV	*W(E2)*	4.05-4	2.55-4	2.24-4	2.46-4
	W(M1)	6.40-3	4.73-3	4.74-3	5.52-3
	λ	2237.8	2451.5	-	2422.5*
S X	*W(E2)*	2.44-2	1.95-2	1.77-2	1.89-2
	W(M1)	1.73+1	1.43+1	1.40+1	1.50+1
	λ	1160.0	1212.6	1186.7	1213.6*

* - λ_{exp} from [1]

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