

LaO LINE LIST FOR THE $A^2\Pi-X^2\Sigma^+$ BAND SYSTEM

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The bands of LaO appear prominently in the spectra of cool S-type stars and can be used to determine La abundances. We have rotationally analyzed the LaO $A^2\Pi-X^2\Sigma^+$ band system up to $v=3$ in the excited state using PGOPHER. The spectroscopic constants for the ground state were taken from our previous analysis of $B^2\Sigma^+-X^2\Sigma^+$ band system [1]. The band and equilibrium constants for the $A^2\Pi$ state were determined. RKR potentials were calculated and band strengths were obtained using LeRoy's LEVEL program with an *ab initio* transition dipole moment. This work also provides calculated radiative lifetimes for $v=0$ to $v=3$ of the A state. A line list for the LaO $A^2\Pi-X^2\Sigma^+$ transition is provided which can be used to simulate LaO spectra in S-type stars.

1. P. F. Bernath, R. Dodangodage and J. Liévin, S-type stars: LaO line list for the $B^2\Sigma^+ - X^2\Sigma^+$ band system, *Astrophys. J.* 933, 99 (2022).