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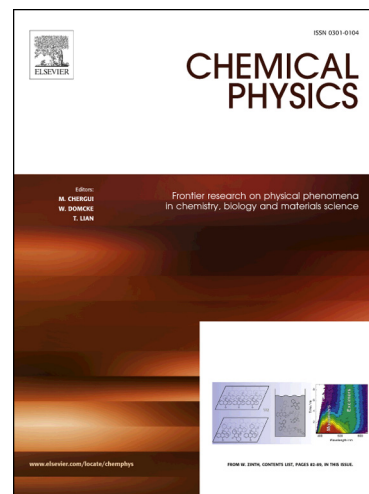
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# Quasirelativistic potential energy curves and transition dipole moments of NaRb

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## Abstract

We report on extensive calculations of quasi-relativistic potential energy curves and, for the first time, transition dipole moments including spin-orbit and scalar-relativistic effects of the NaRb molecule. The calculated curves of the  $0^+$ ,  $0^-$ , 1, 2 and 3 molecular states correlate for large internuclear separation with the fourteen lowest atomic energies up to the  $\text{Na}(3s^2S_{1/2})+\text{Rb}(7s^2S_{1/2})$  atomic limit. Several new features of the potential energy curves have been found.

*Keywords:* potential energy curves, spin-orbit effect, MRCI, spectroscopic parameters, transition dipole moment functions

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## 1. Introduction

The interest in laser cooling and trapping of atoms shifts to polar diatomic molecules since, due to their internal degrees of freedom, they may find broader applications in ultracold chemistry, quantum information and quantum simula-  
5 tions. Particularly, the heteronuclear alkali dimers attract considerable atten-

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