

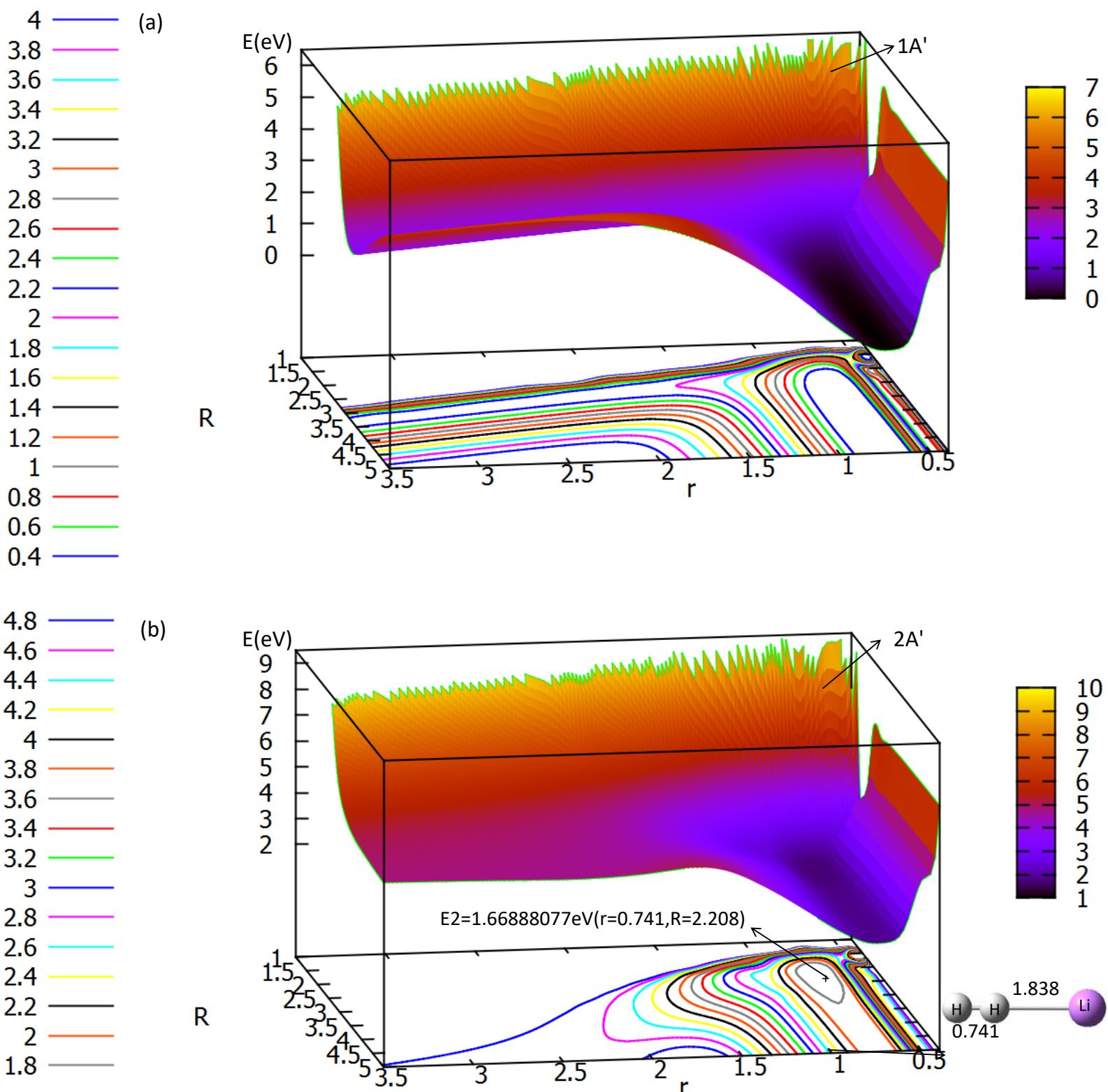
# Accurate potential energy surfaces for the first two lowest electronic states of Li (2p) + H<sub>2</sub> reaction

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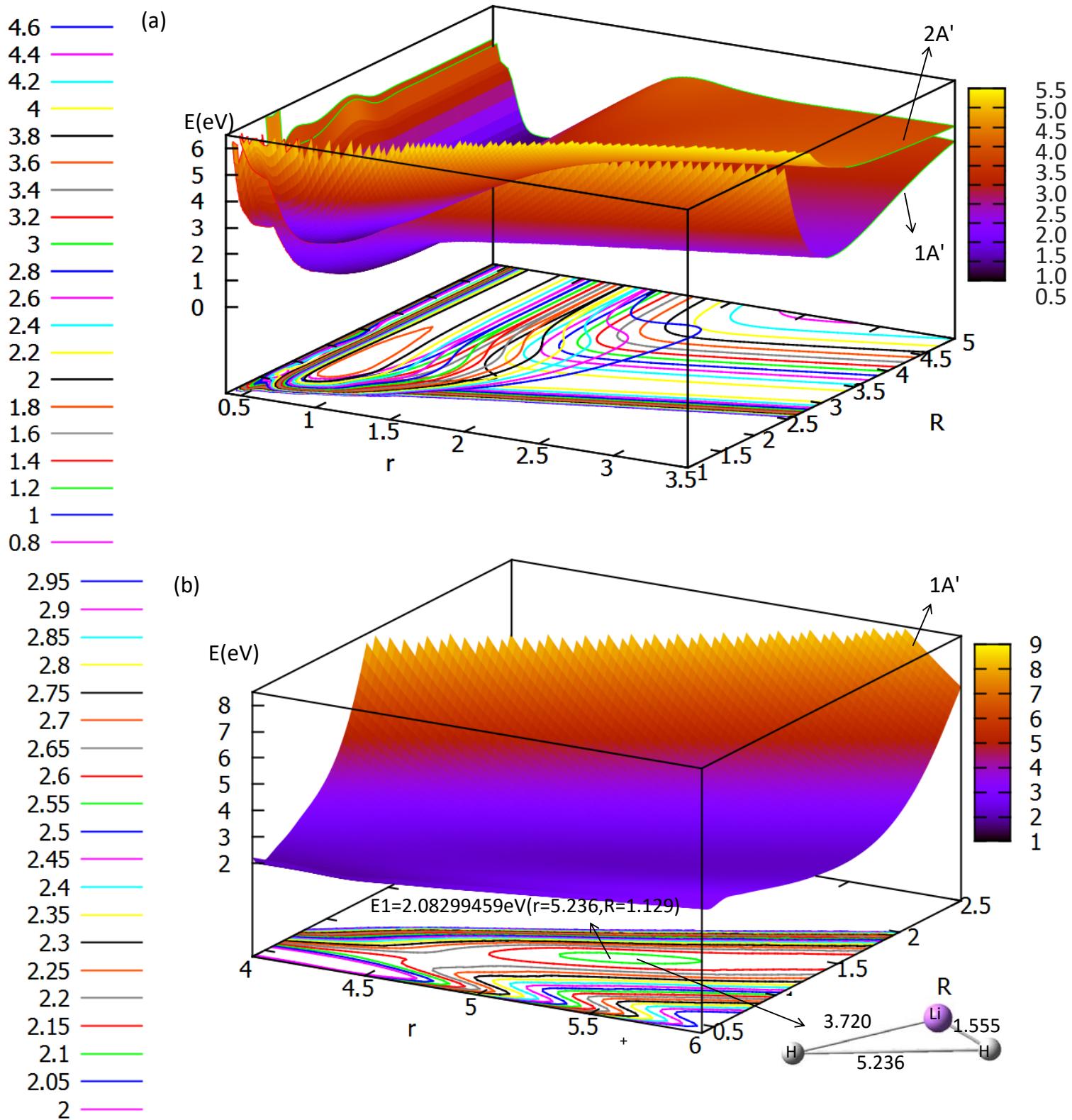
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**Figure 1A:** Separated plotting the ground state ( $1\text{A}'$ ) and the first excited state ( $2\text{A}'$ ) PESs at  $\theta=0^\circ$  in Jacobi coordinate.



**Figure 2A:** Two potential energy surfaces (in eV) and contour plots of the potential energy surface as a function of distances  $r$  and  $R$  (in Å) at  $\theta=15^\circ$ .

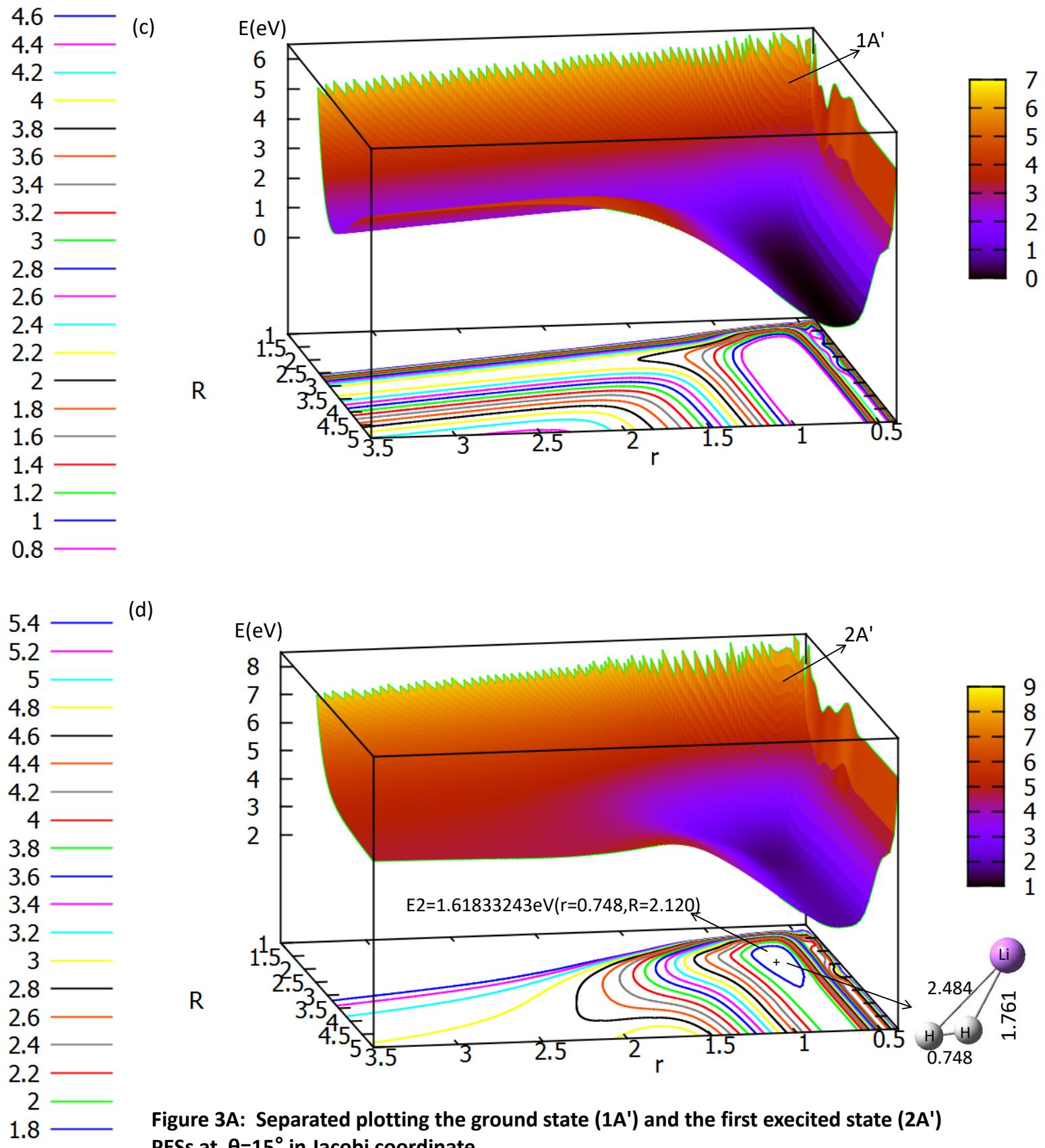
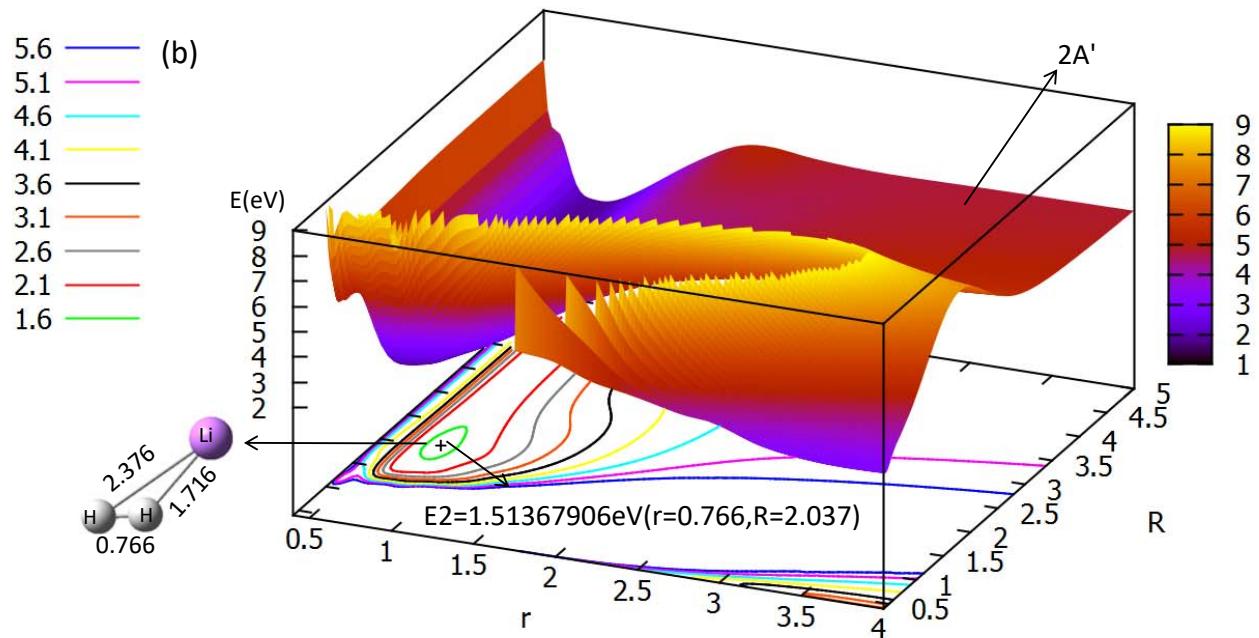
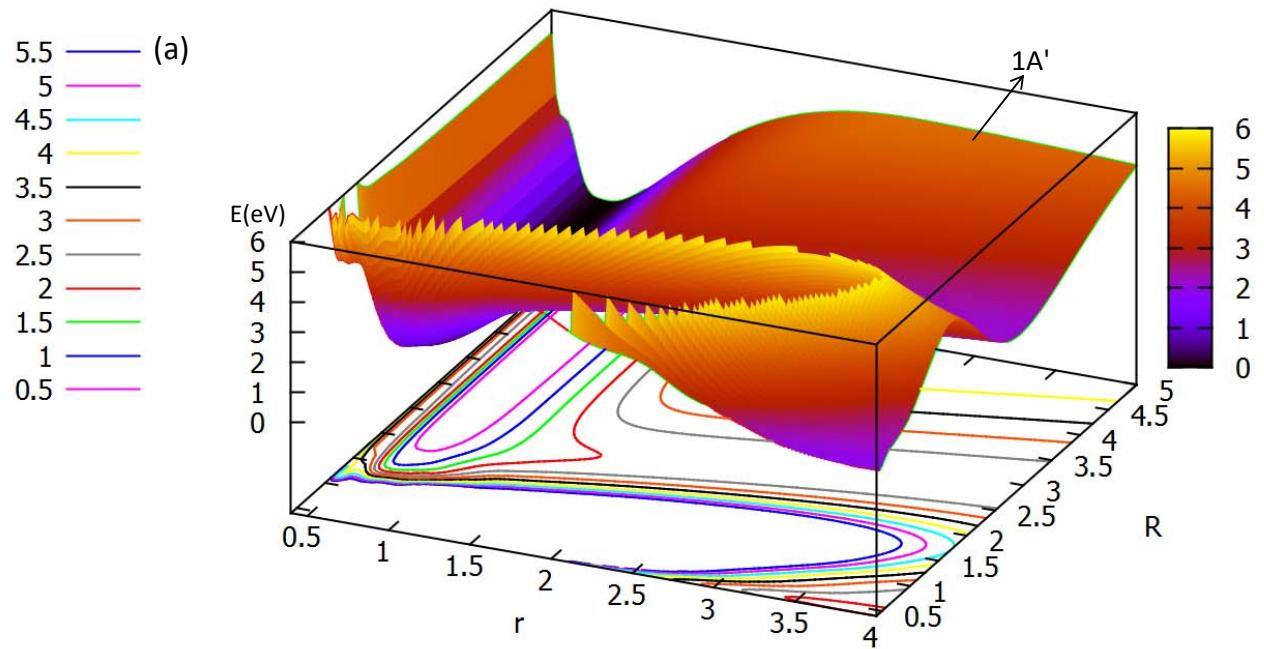


Figure 3A: Separated plotting the ground state ( $1A'$ ) and the first excited state ( $2A'$ ) PESs at  $\theta=15^\circ$  in Jacobi coordinate.



**Figure 4A:** Separated plotting the ground state ( $1A'$ ) and the first excited state ( $2A'$ ) PESs at  $\theta=30^\circ$  in Jacobi coordinate.

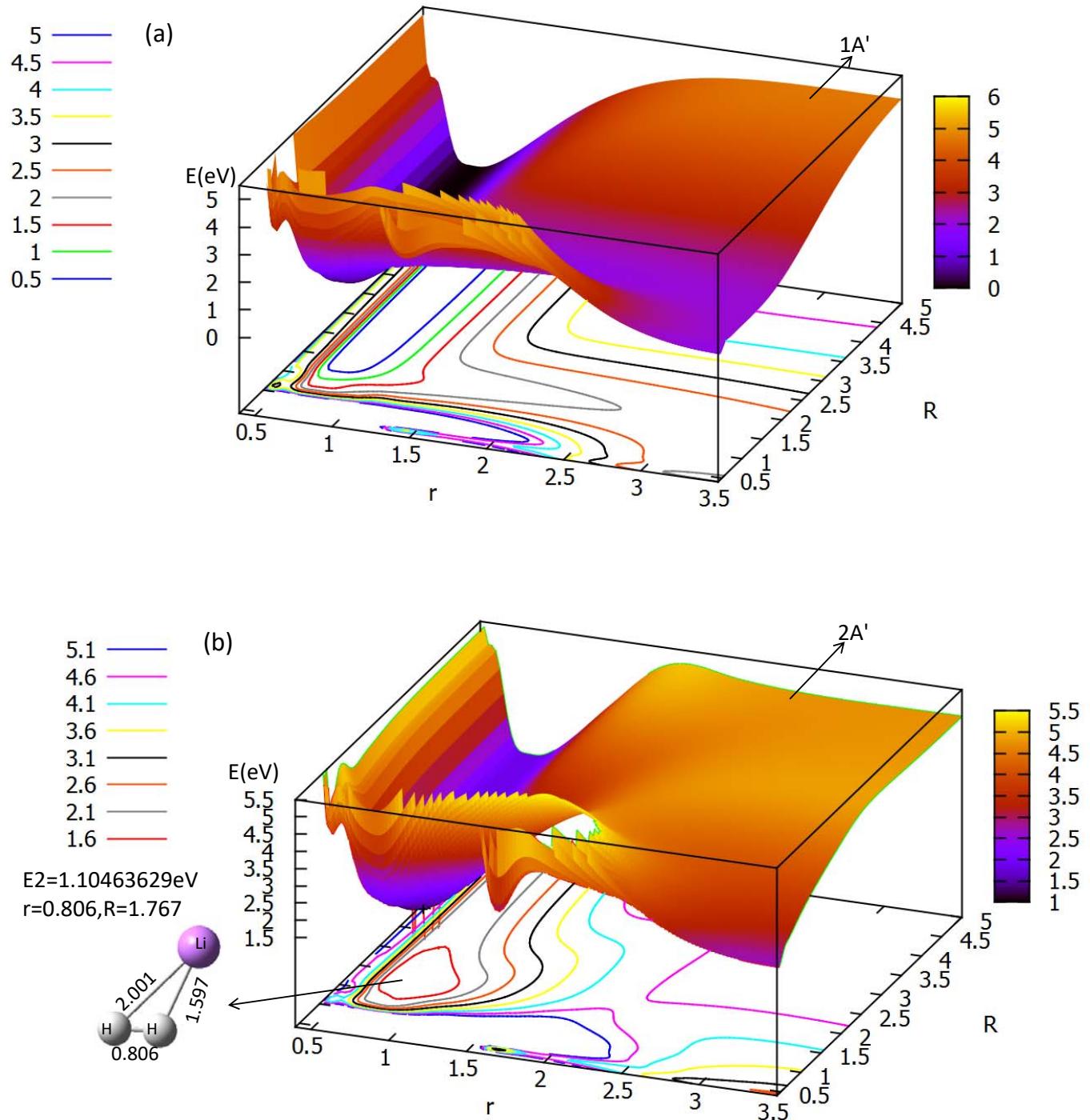
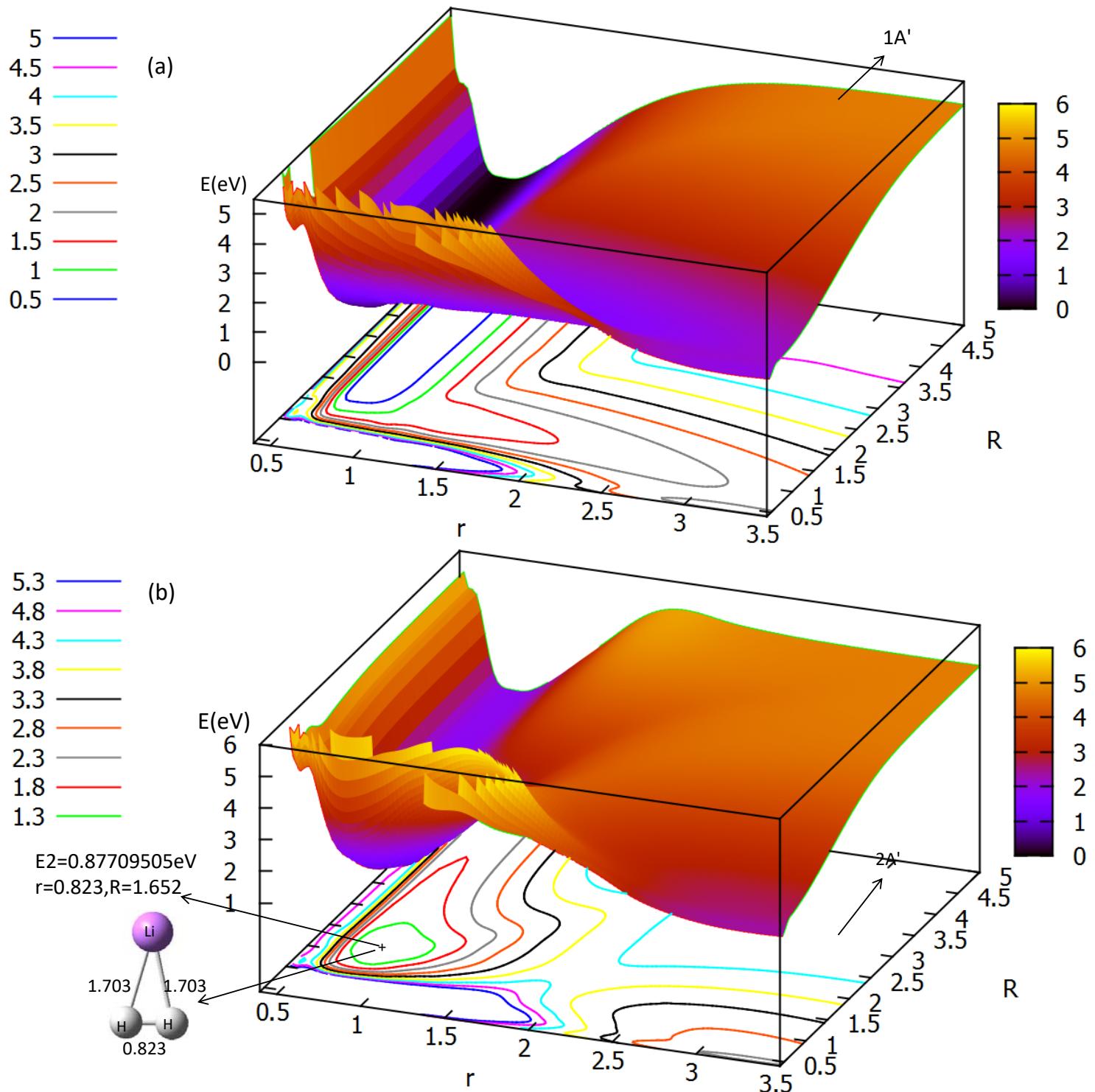


Figure 5A: Separated plotting the ground state ( $1\text{A}'$ ) and the first excited state ( $2\text{A}'$ ) PESs at  $\theta=60^\circ$  in Jacobi coordinate.



**Figure 6A:** Separated plotting the ground state ( $1A'$ ) and the first excited state ( $2A'$ ) PESs at  $\theta=90^\circ$  in Jacobi coordinate.