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## **Analysis of aluminium structure under tension based on Quantum mechanics**

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**Abstract:** In this study, based on the density functional theory (DFT), the mechanical properties of pure aluminium have been studied. Aluminium nanostructures are analyzed under strain of varying degrees, and its effects on strain energy and stress are investigated. The ideal tensile strength of pure aluminium is obtained under axial tensile strain along [001]. Two models of different sizes are analyzed and the stress-strain relation of pure aluminium are developed. The calculated results are compared with the results obtained from the experimental tensile tests on a real aluminium alloy of type 6061.

**Keywords:** DFT analysis, Aluminium 6061, stress-strain curve.