

Pseudospin

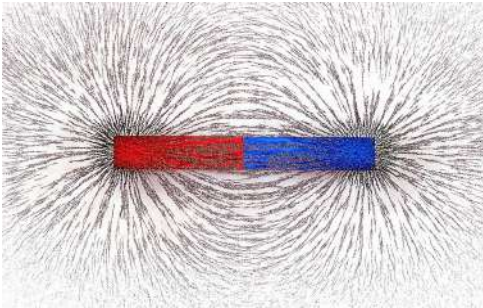
Gareth Conduit

TCM Group, Department of Physics

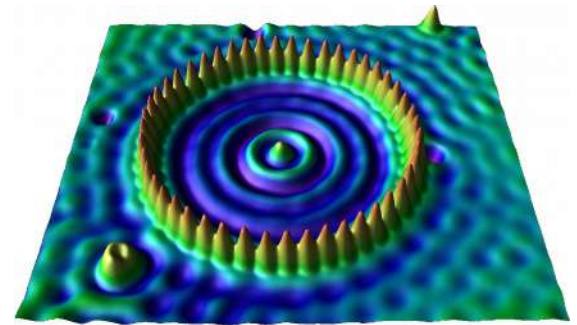
Physics of materials



Interactions



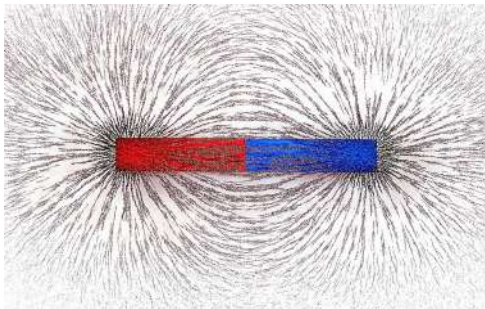
Quantum mechanics



Physics of materials

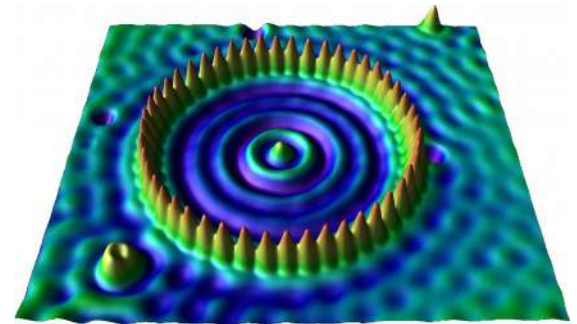


Interactions

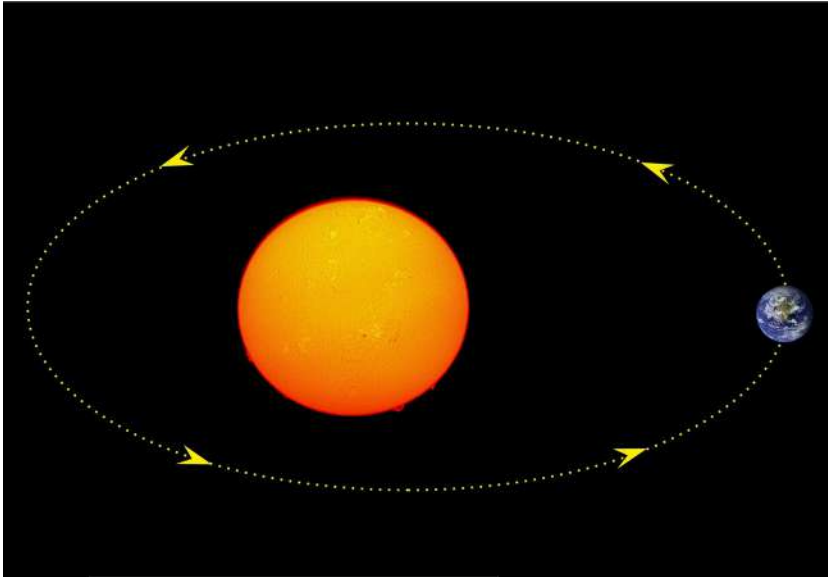


Simplify

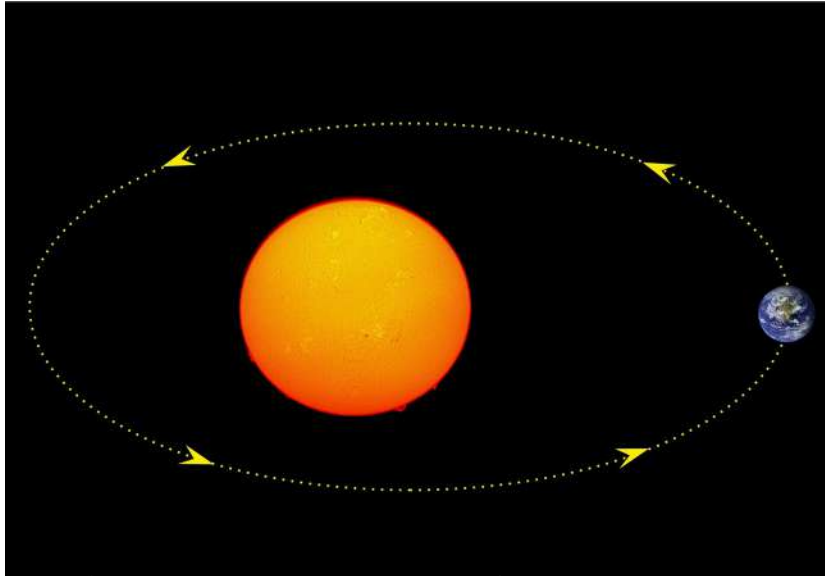
Quantum mechanics



Interactions



Many-body interactions



Gravity on Earth



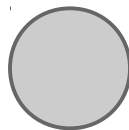
Gravity on Earth



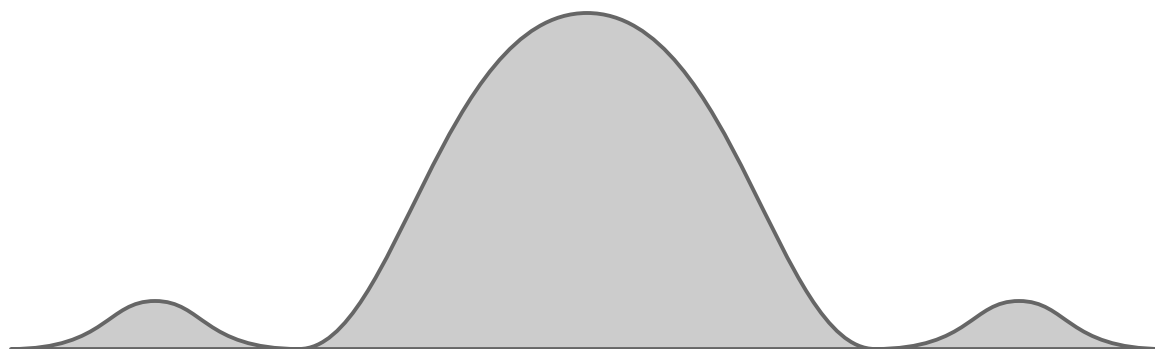
Gravity on Earth



Quantum mechanics



Quantum mechanics



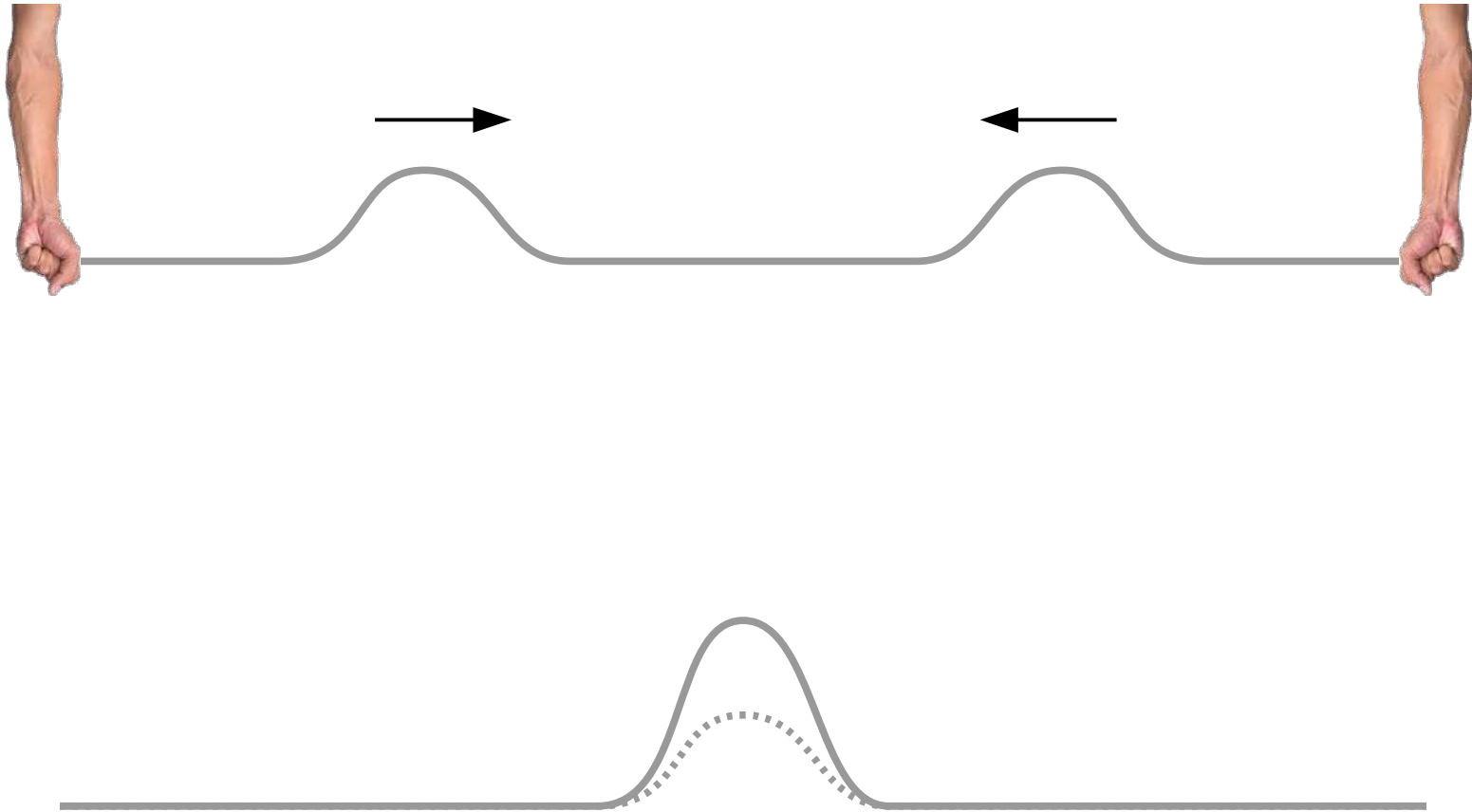
Wave superposition



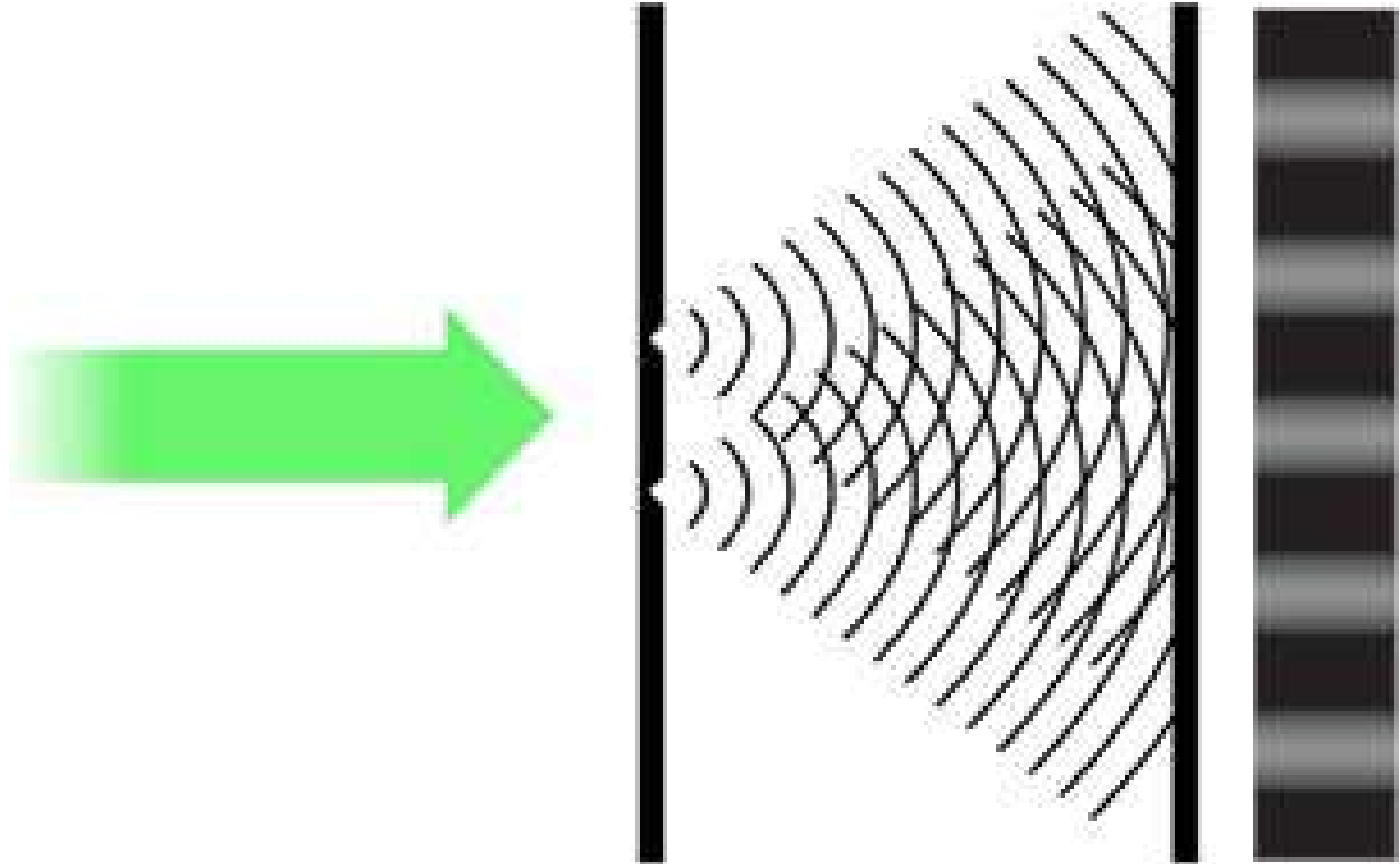
Wave superposition



Wave superposition



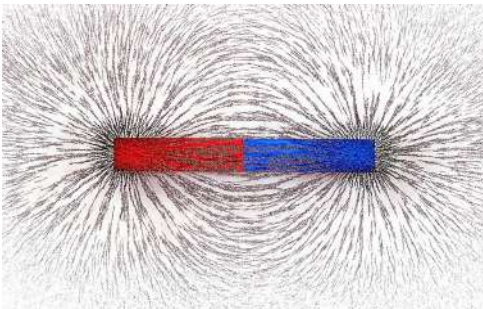
Interference of a laser beam



Physics of materials

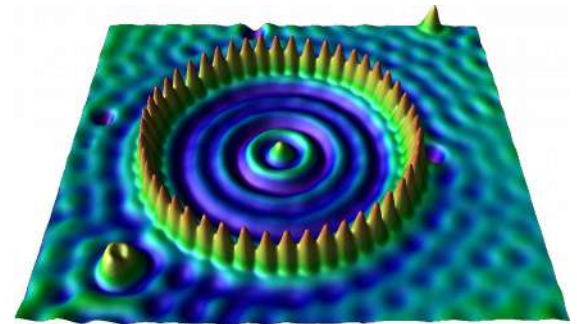


Interactions

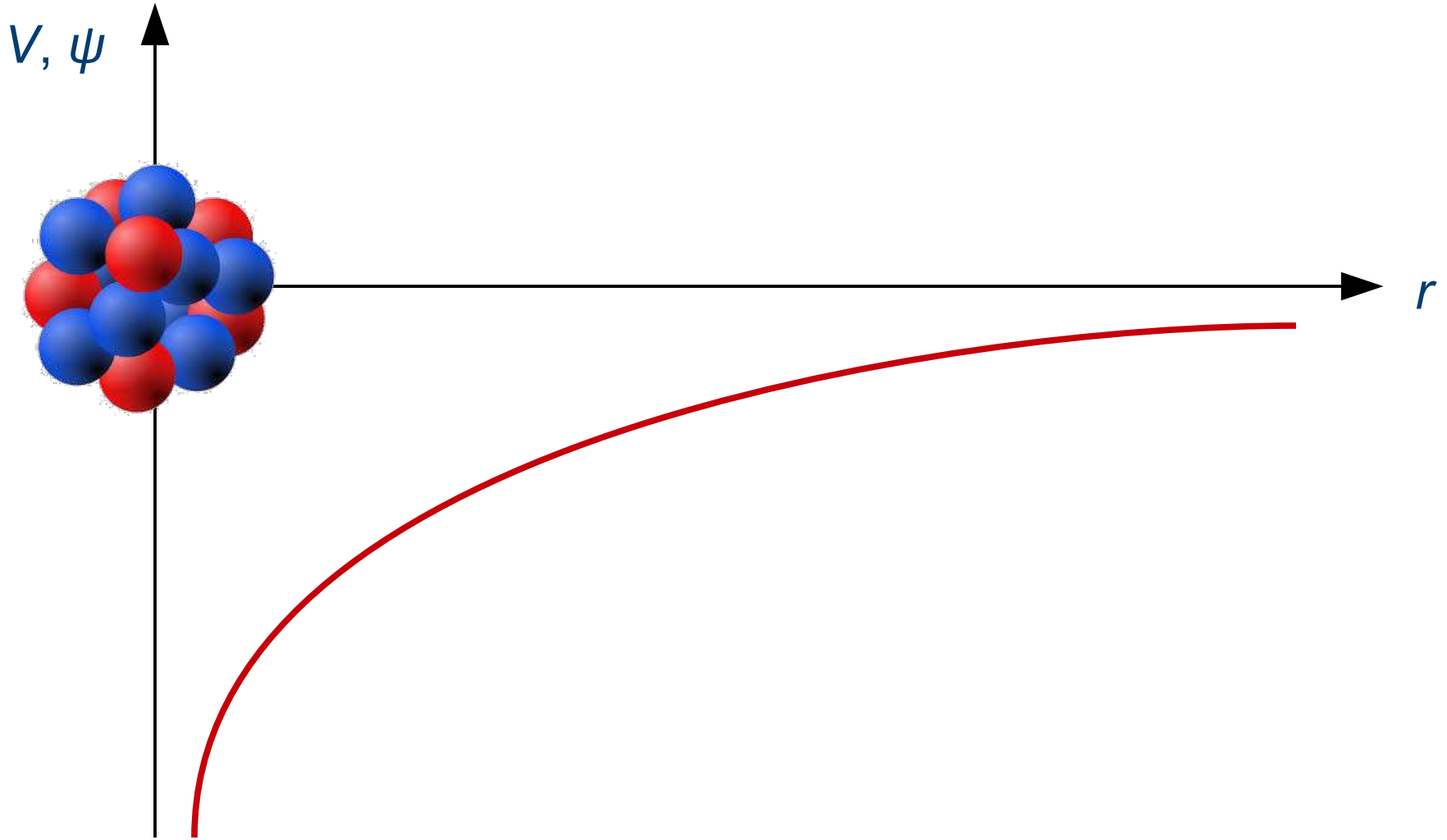


Simplify

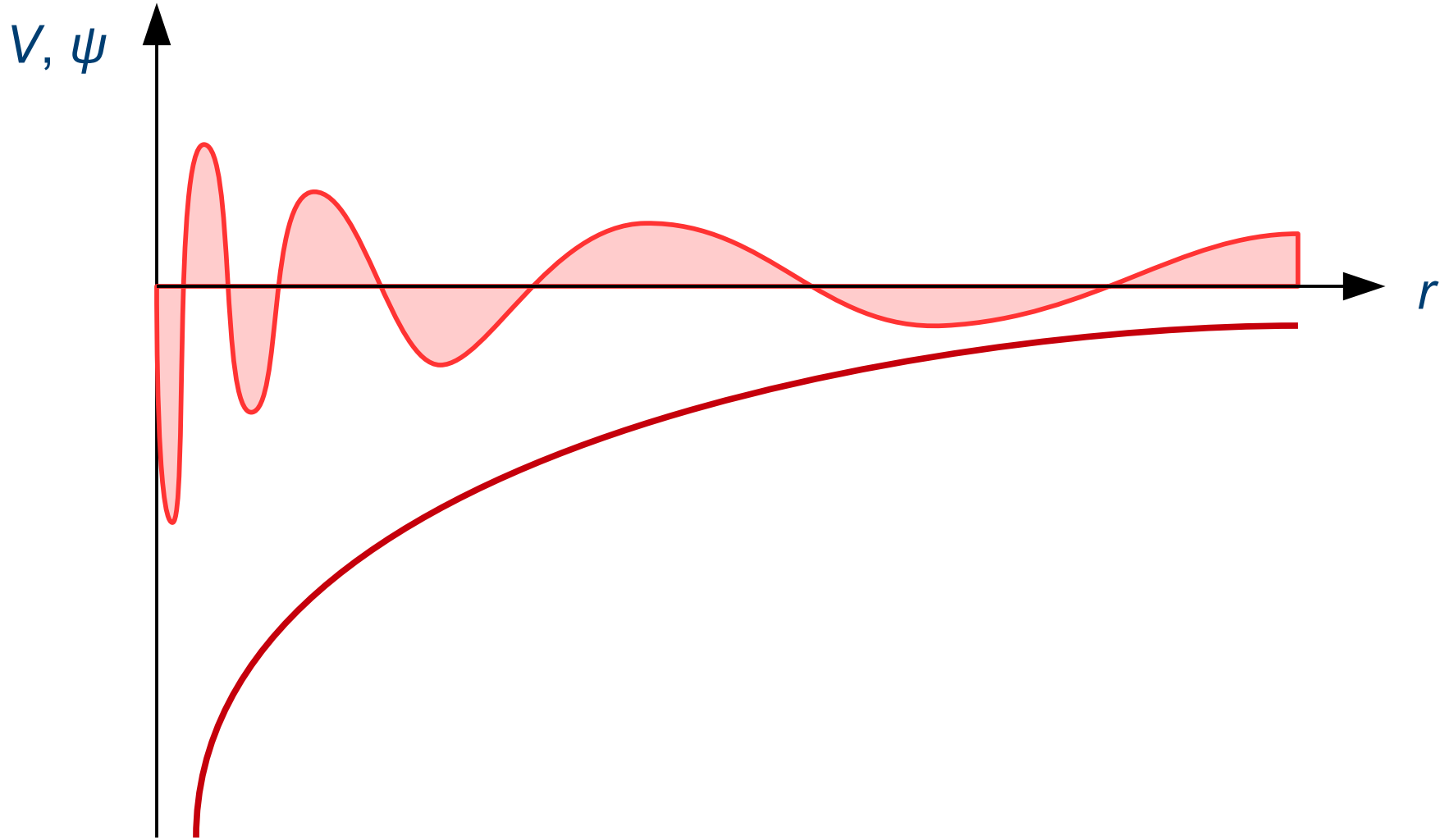
Quantum mechanics



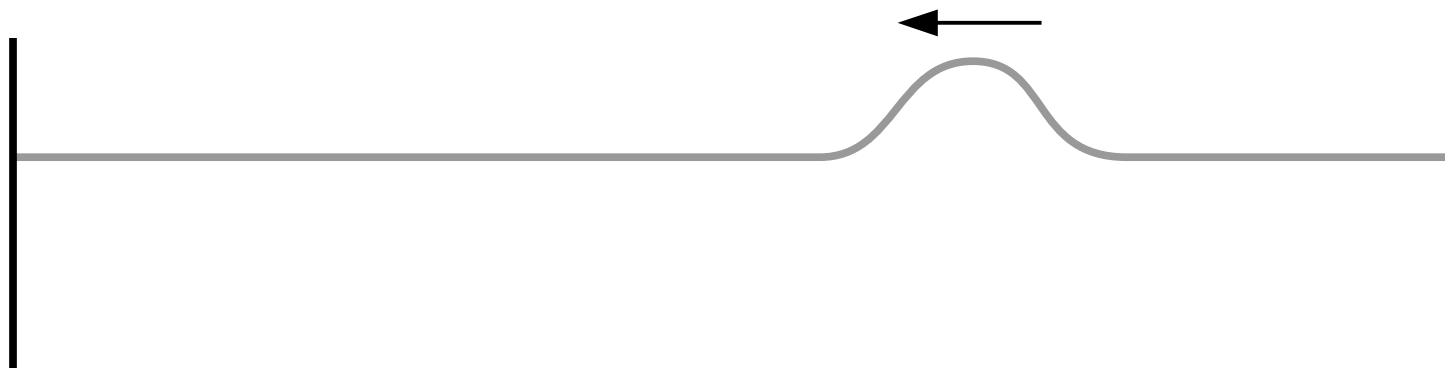
Electron-atom interaction



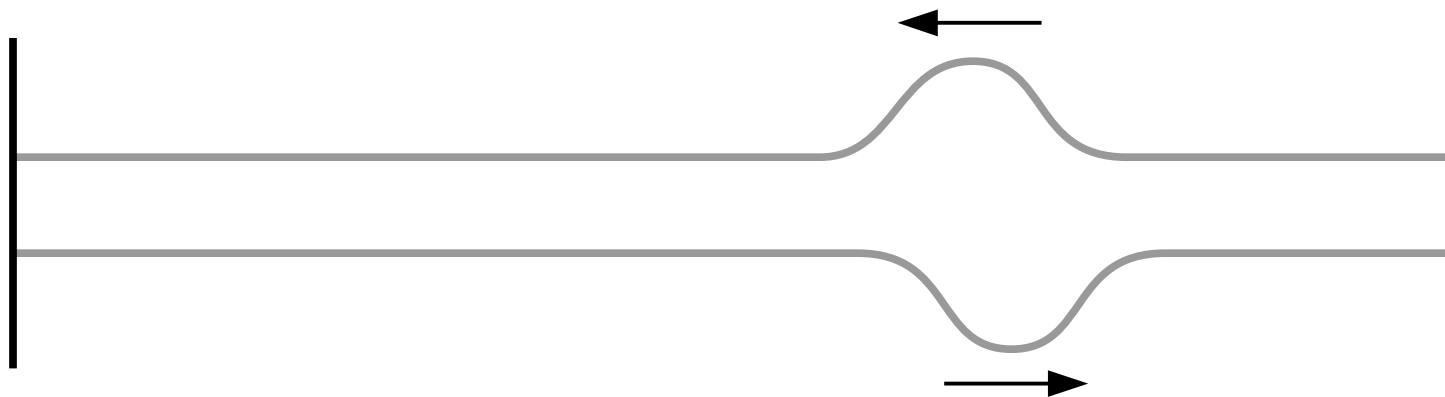
Electron-atom interaction



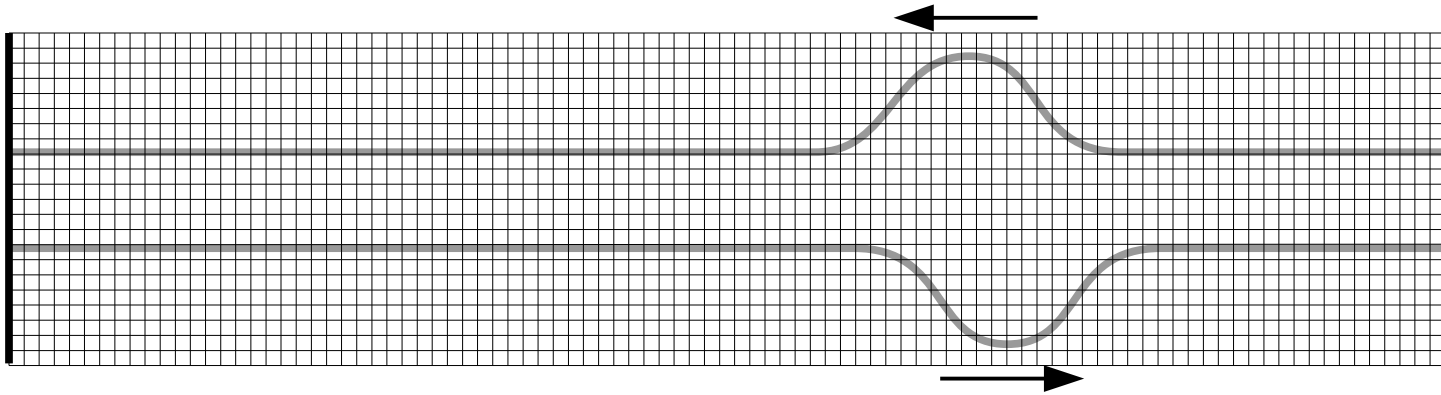
Pseudopotential for a slinky



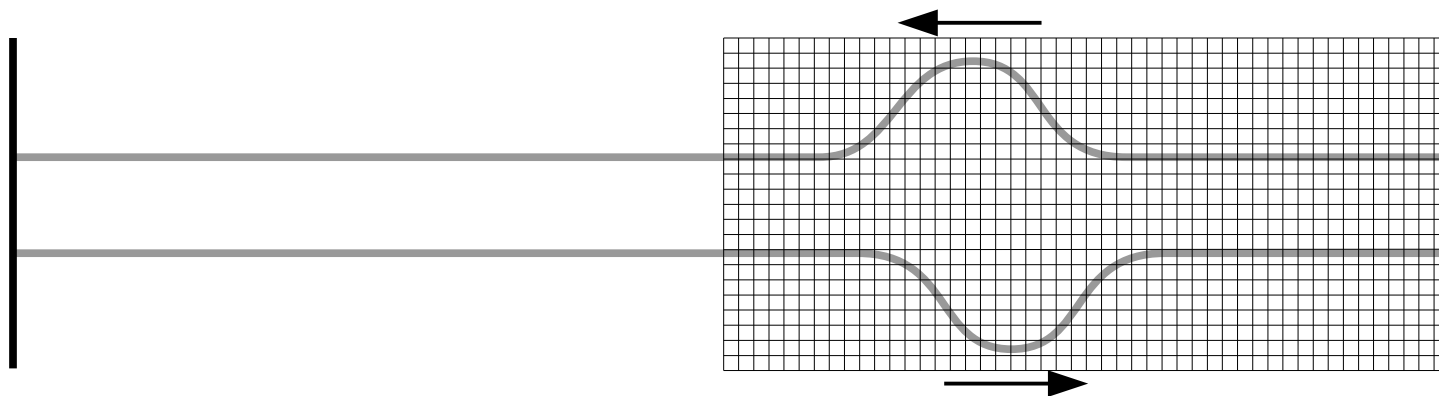
Pseudopotential for a slinky



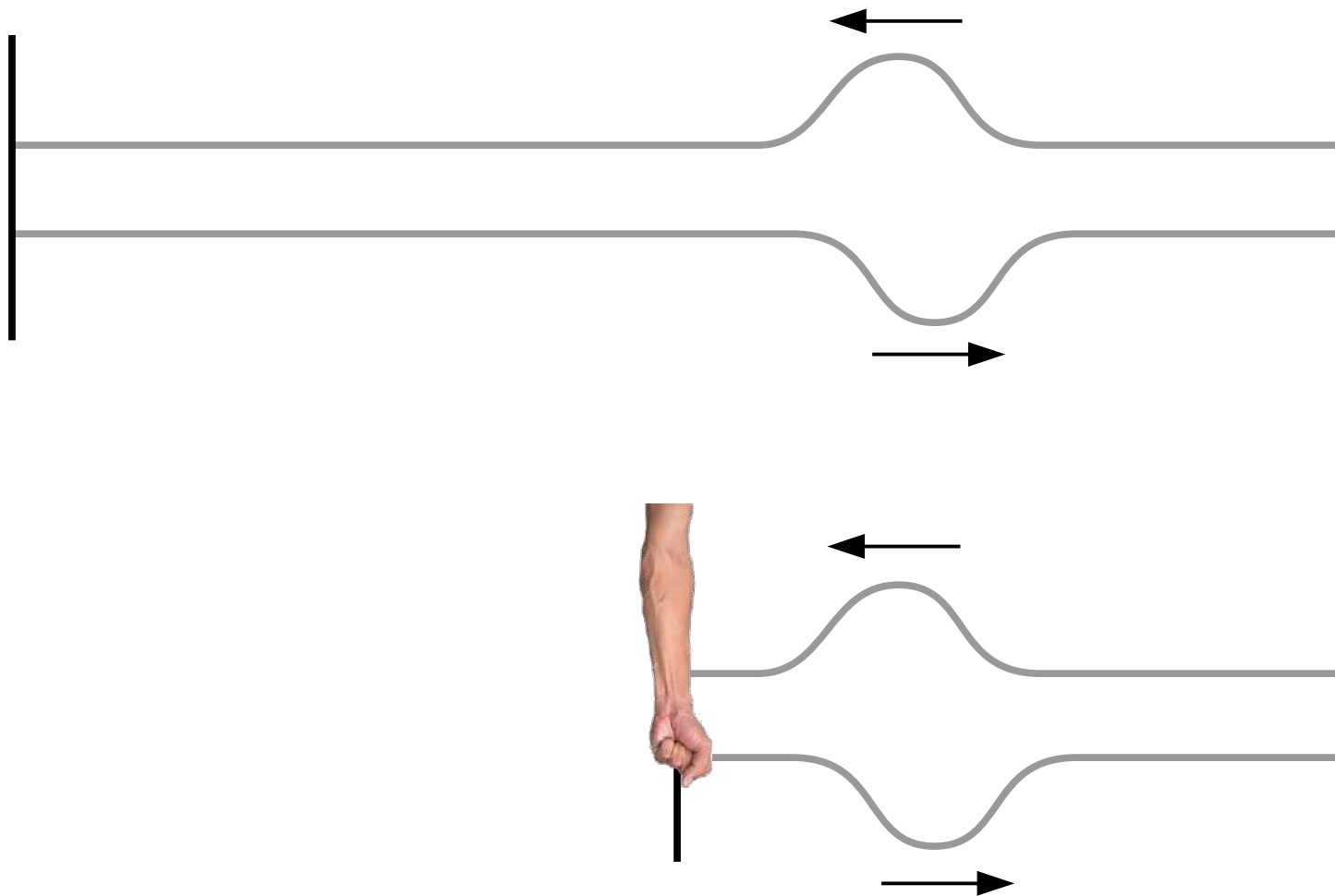
Pseudopotential for a slinky



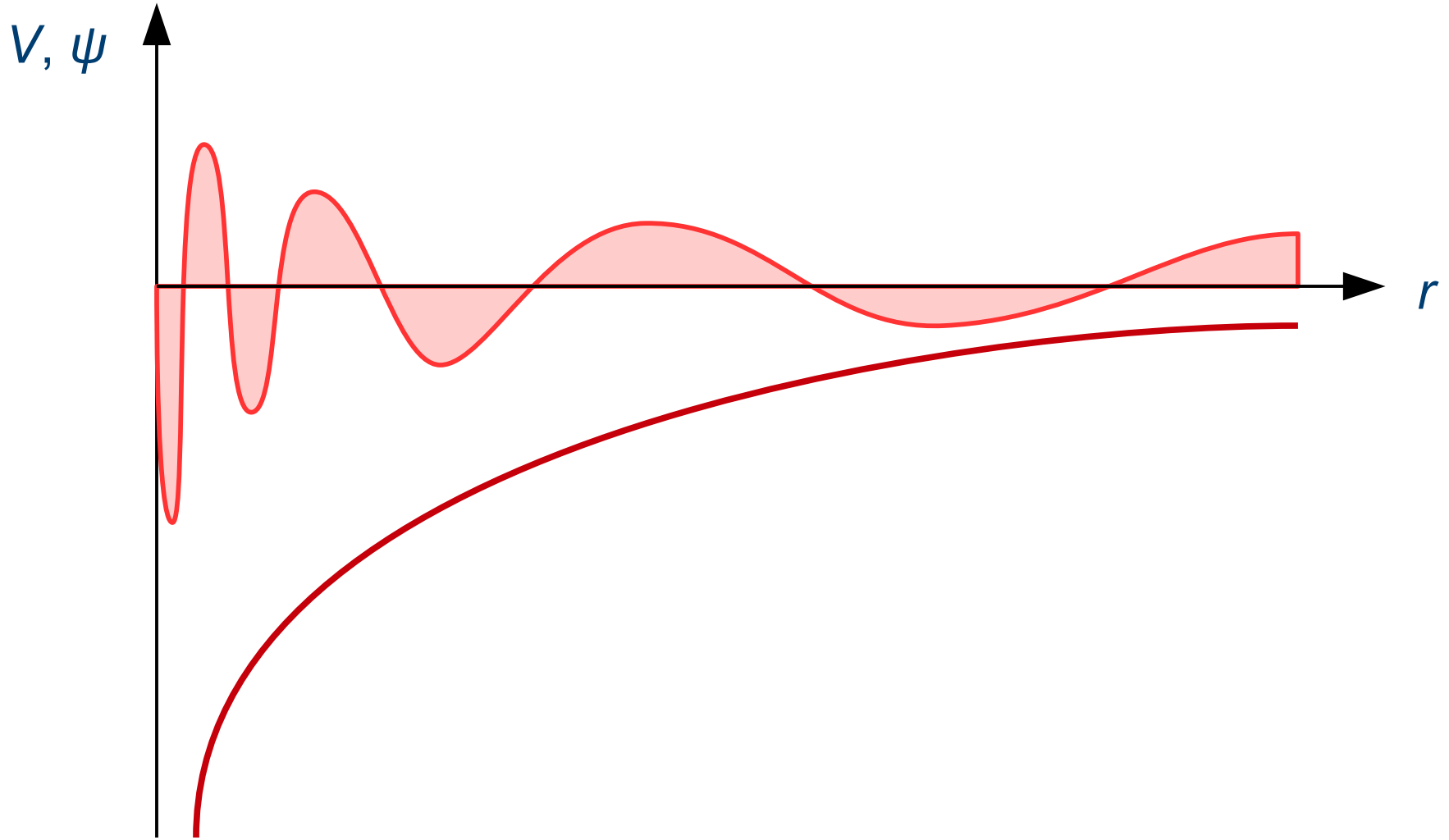
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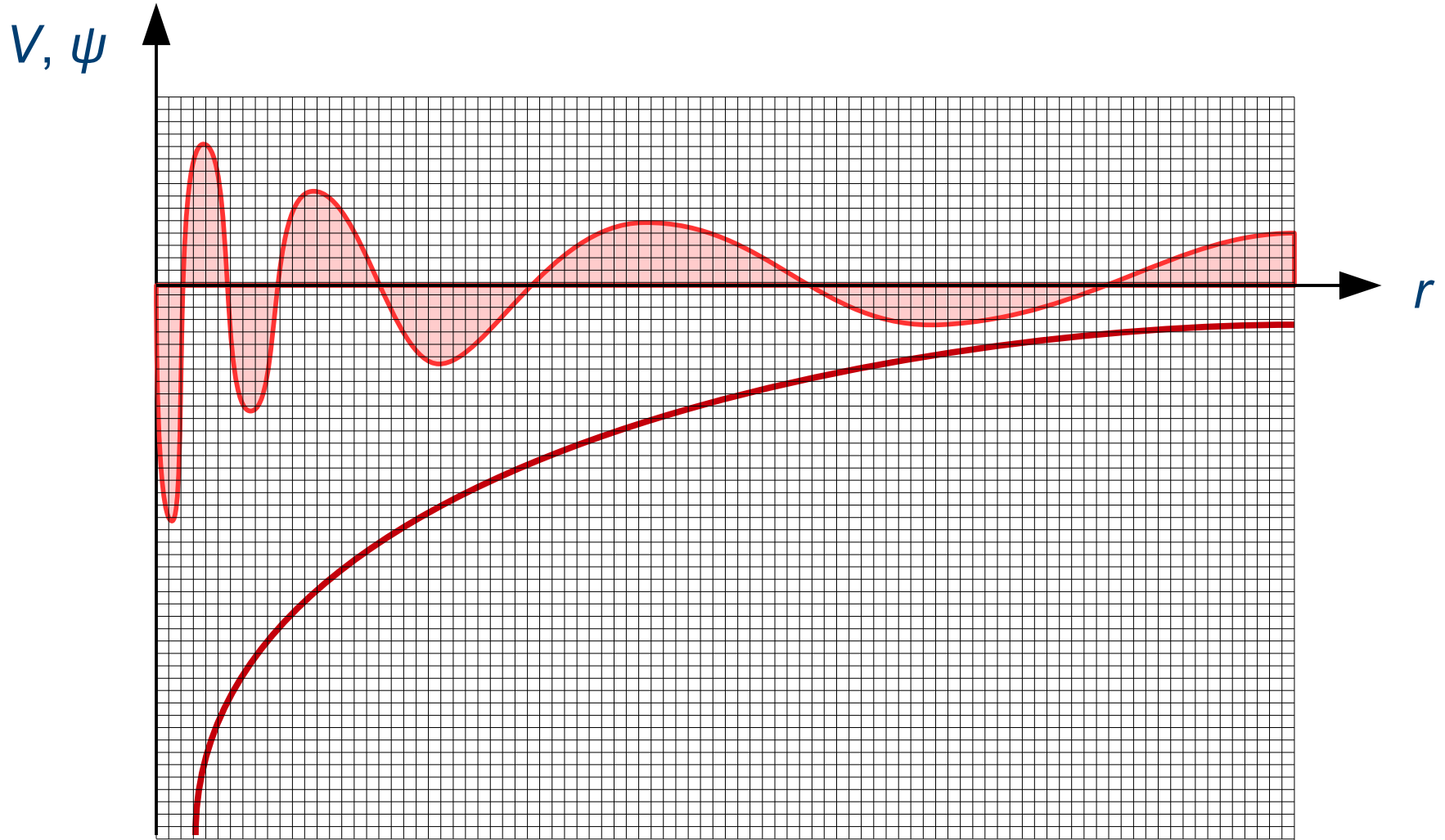
Pseudopotential for a slinky



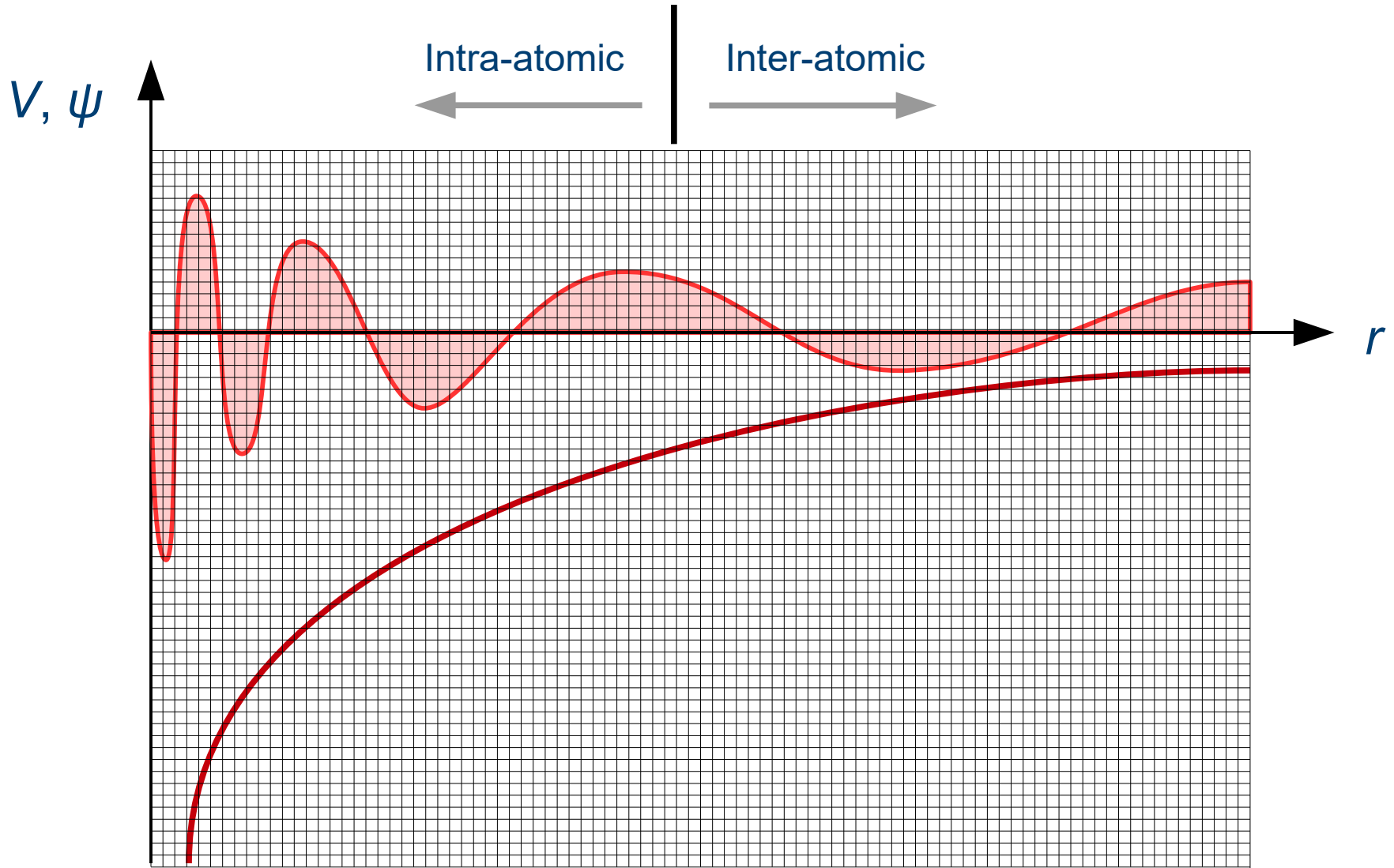
Problem of interactions



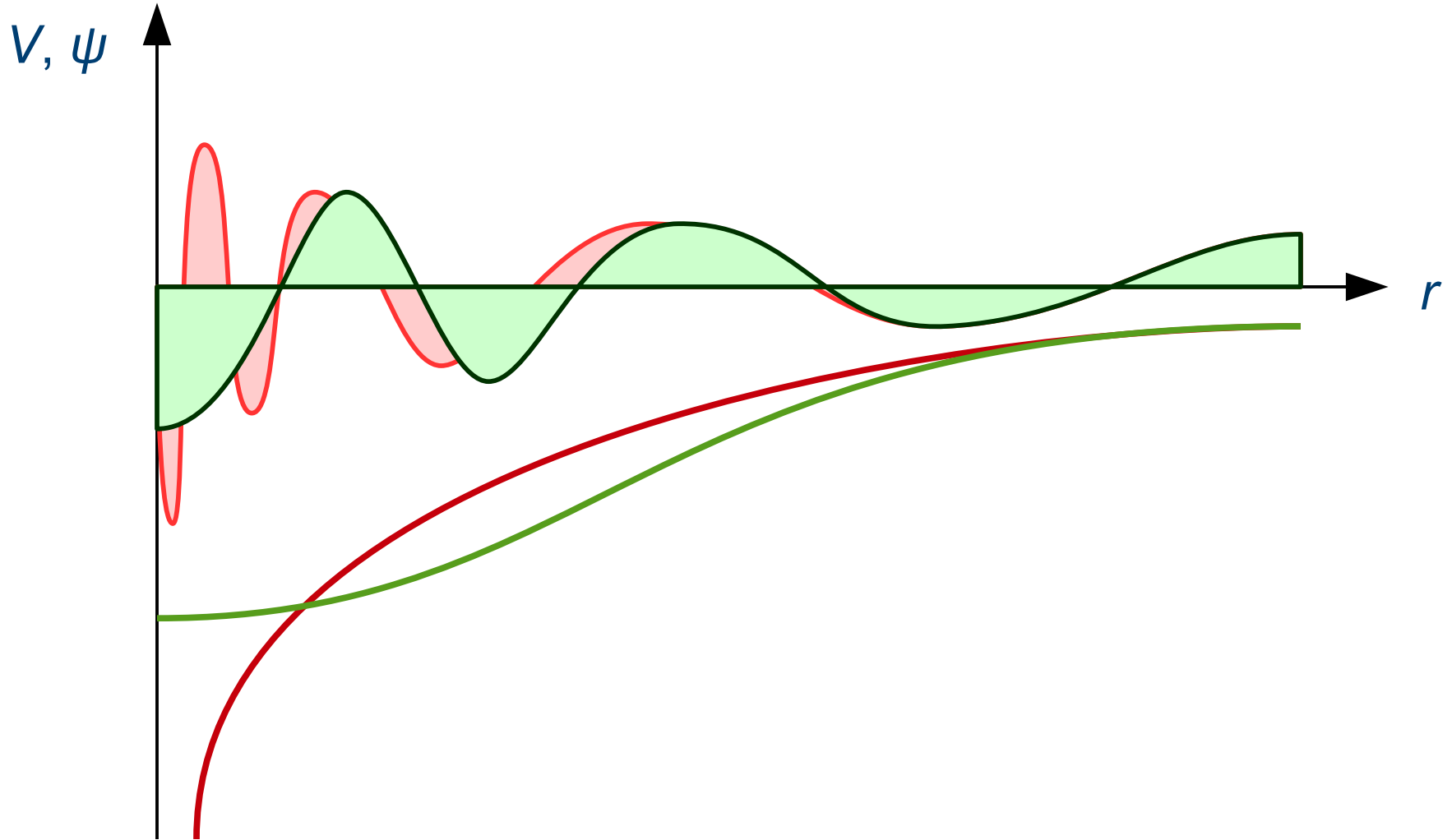
Problem of interactions



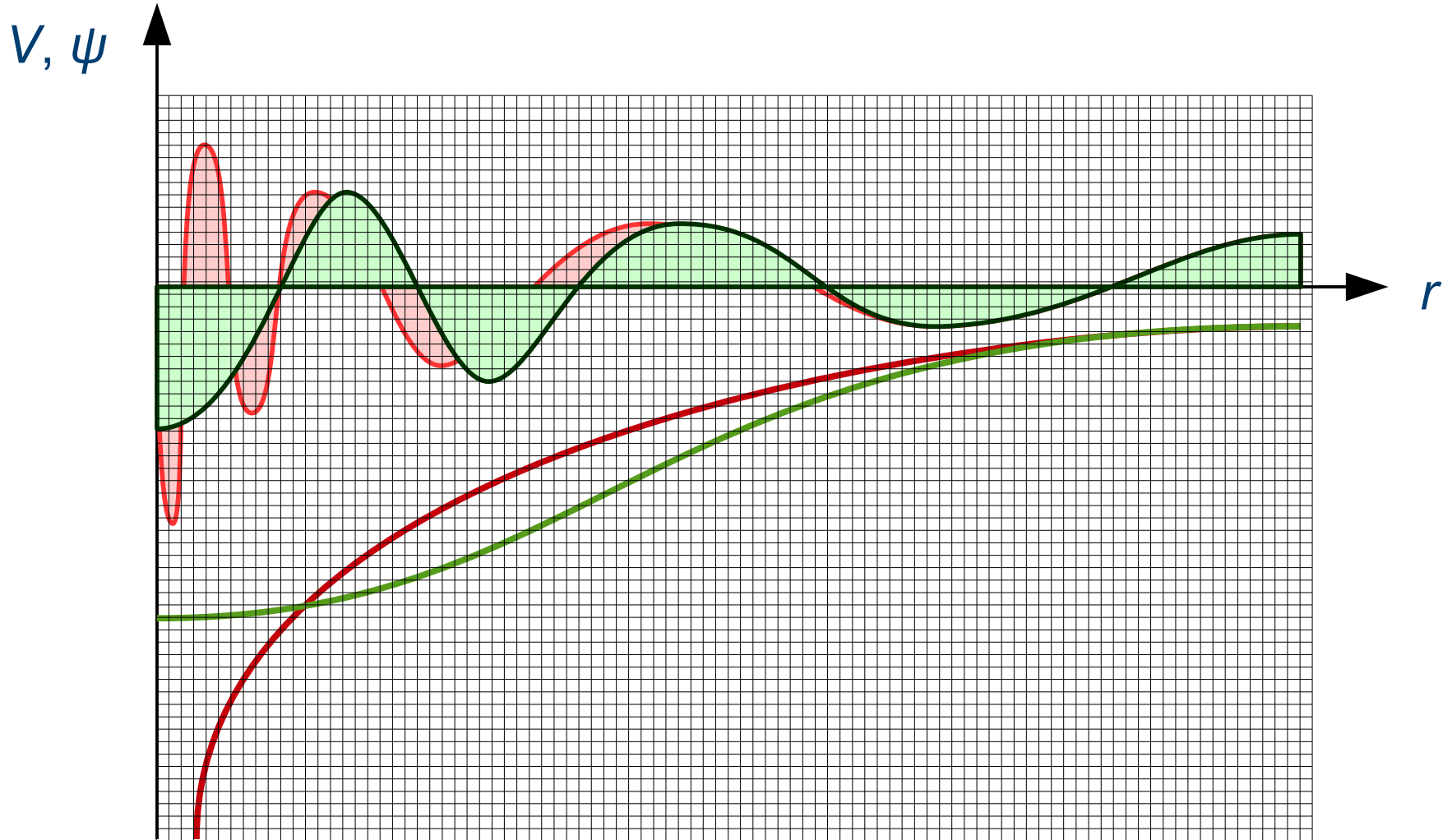
Problem of interactions



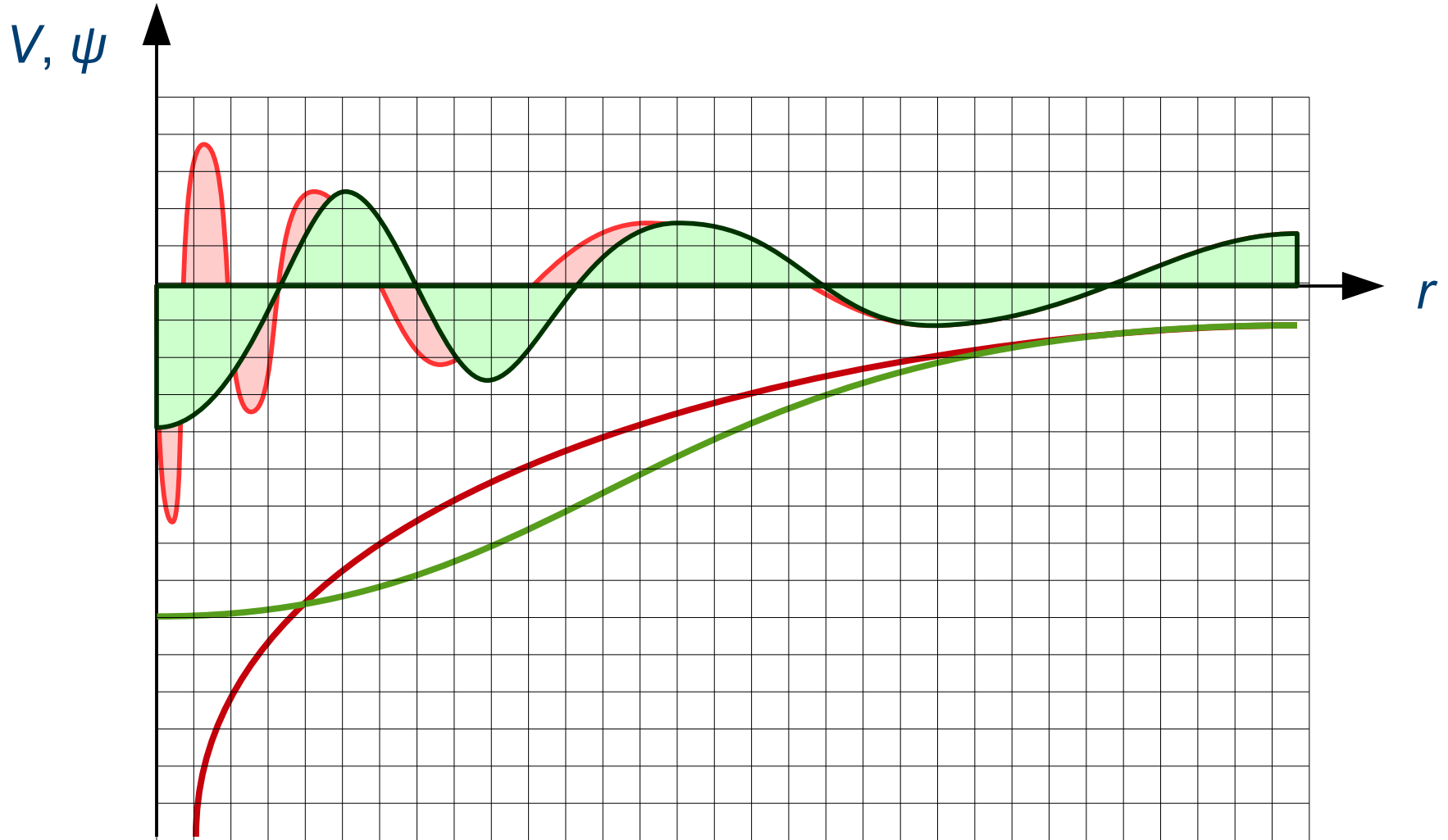
Generating a pseudopotential



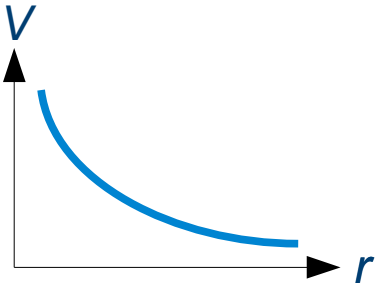
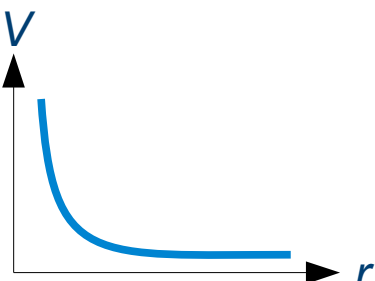
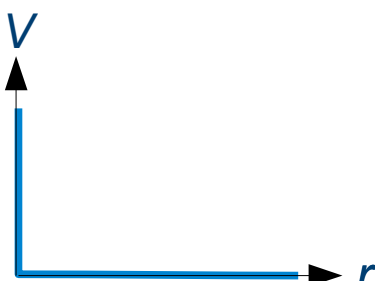
Generating a pseudopotential



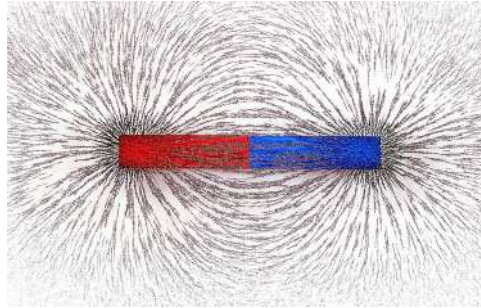
Generating a pseudopotential



Pseudopotentials

Coulomb		Electrons	x 30
Dipole		Cold atom gas	x 2000
Contact		Cold atom gas	x 30000

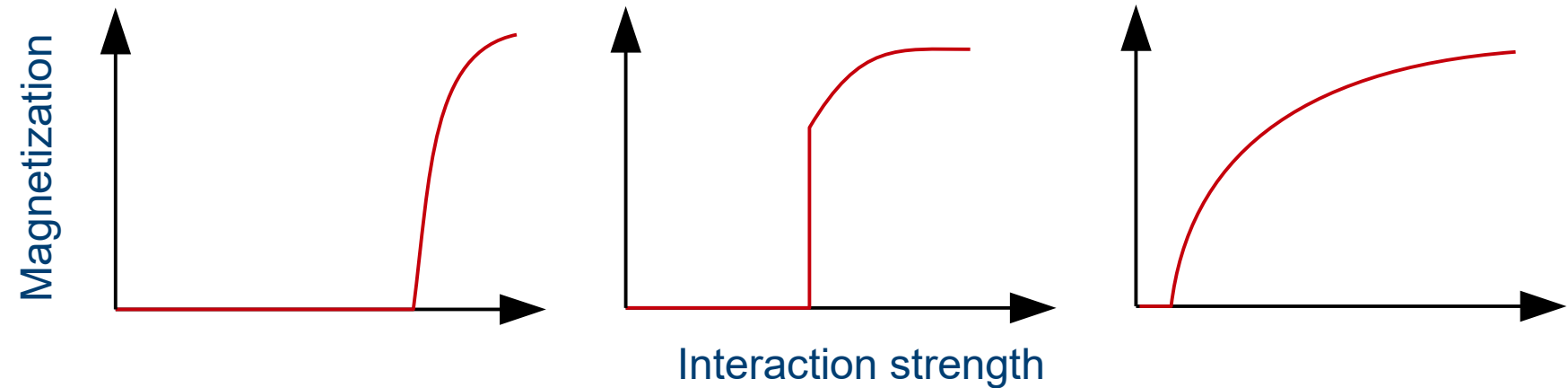
Applications



1930

1998

2015



Summary

Proposed a new approach for interaction potentials

Accelerated computation by up to x 30000

Studied ferromagnetic transition

Waves interfere

