4 A helium nucleus contains two protons.

In a model of the helium nucleus, each proton is considered to be a charged point mass. The separation of these point masses is assumed to be 2.0×10^{-15} m.

(a) For the two protons in this model, calculate

(i) the electrostatic force,

electrostatic force = ... N [2]

(ii) the gravitational force.

gravitational force = ... N [2]

(b) Using your answers in **(a)**, suggest why

(i) there must be some other force between the protons in the nucleus,

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..... [3]

(ii) this additional force must have a short range.

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..... [2]