Lecture Notes

Quantum Mechanics II

Gavin Kerr (B00801584)

PHYC 0000

Physics and Atmospheric Science
Dalhousie University

1 Definitions

Linear Vector Space: Collection of objects

$$
\begin{aligned}
|v\rangle + |w\rangle \, \varepsilon \, V \\
a(|v\rangle + |w\rangle) =& a|v\rangle + a|w\rangle \\
a(b|v\rangle) =& b(a|v\rangle) \\
|v\rangle + |w\rangle =& |w\rangle + |v\rangle \\
|v\rangle + (|w\rangle + |x\rangle) =& (v\rangle + |w\rangle) + |x\rangle
\end{aligned}
$$

There needs to be a null vector$(|0\rangle) \rightarrow |v\rangle + |0\rangle = 0$

For every vector (v) there is an inverse$|v\rangle + |-v\rangle = |0\rangle$

2022-09-07

2 Vector Spaces

Def. Linear Vector Space: Collection of objects which follow the rules below

$$
\begin{aligned}
|v\rangle + |w\rangle \, \varepsilon \, V \\
a(|v\rangle + |w\rangle) =& a|v\rangle + a|w\rangle \\
a(b|v\rangle) =& b(a|v\rangle) \\
|v\rangle + |w\rangle =& |w\rangle + |v\rangle \\
|v\rangle + (|w\rangle + |x\rangle) =& (v\rangle + |w\rangle) + |x\rangle
\end{aligned}
$$

There needs to be a null vector$(|0\rangle) \rightarrow |v\rangle + |0\rangle = 0$

For every vector (v) there is an inverse$|v\rangle + |-v\rangle = |0\rangle$