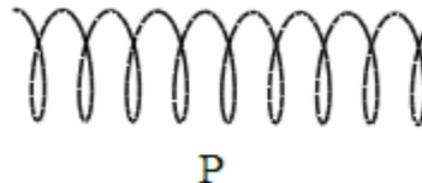
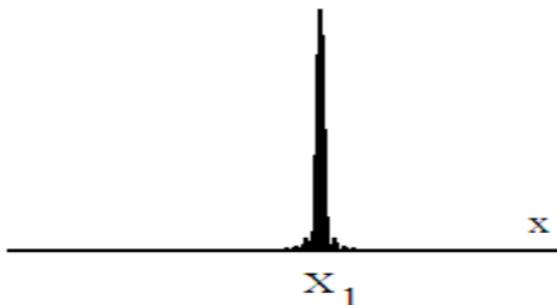


## 1.23: Very Brief Relationship Between the Coordinate and Momentum Representations

A quon has position  $x_1 : |x_1\rangle$

Coordinate space  $\Leftrightarrow$  Momentum space

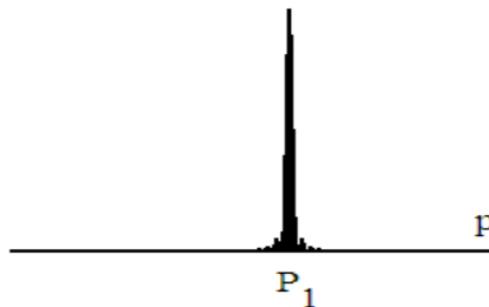
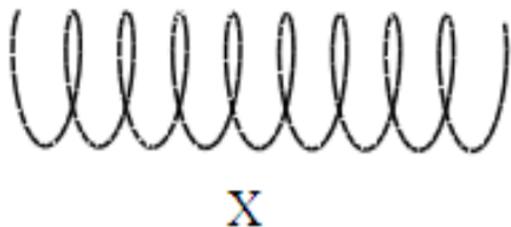
$$\langle x|x_1\rangle = \delta(x - x_1) \quad \langle p|x_1\rangle = \int \langle p|x\rangle \langle x|x_1\rangle dx \langle p|x_1\rangle = \exp\left(-\frac{ipx_1}{\hbar}\right)$$



A quon has momentum  $p_1 : |p_1\rangle$

Coordinate space  $\Leftrightarrow$  Momentum space

$$\langle x|p_1\rangle = \exp\left(\frac{ip_1x}{\hbar}\right) \quad \int \langle p|x\rangle \langle x|p_1\rangle dx \langle p|p_1\rangle = \delta(p - p_1)$$



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