

Abstract Submitted  
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**Delayed Choice in Feynman's Neutron Scattering Off a Crystal Experiment: The Effect of Information on the Neutron Distribution** DOUGLAS SNYDER, None — Feynman (Lect. on Phys., v. 3, 1965, ps. 3-7 to 3-9) maintained in his neutron scattering off a crystal experiment that which-way info can exist even if one does not perform a measurement. This interaction involves a spin flip for both the neutron and nucleus that the neutron scatters off. With the flip, the spin of the nucleus that the neutron scattered off becomes different than the spin direction of all the other nuclei in the crystal that the neutron could have scattered off. The spins of all the other nuclei are the same. It may be possible to eliminate the ww info as long as particle detections have not been made. Through spin-lattice relaxation after the neutron-nucleus interaction occurs, the spin flip of the nucleus would reverse before any detection is made. It would no longer be possible to determine which nucleus the neutron scattered off. The result is only interference in the distribution of the neutrons. This change from ww info to interference would be affected by a change in info regarding the nuclei in the crystal since there is no physical process whereby the change in the nuclei can affect the distribution of the neutrons. Altering relaxation duration relative to neutron detection time could provide a delayed choice. Another possibility would be to shut off the uniform, strong, external magnetic field  $B$ , that initially aligns all of the spins of the nuclei along the same axis, after the spin flip and before the neutron is detected. Ww info would be eliminated since the spin directions of all the nuclei would quickly become essentially random. Maintaining or turning off  $B$  could be a delayed choice.

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None

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