

## Refutation of superposition as a red herring of Schrödinger's cat

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We assume the method and apparatus of Meth8/VL4 with  $\mathbf{T}$  as the designated *proof* value,  $\mathbf{F}$  as contradiction,  $\mathbf{N}$  as truthity (non-contingency), and  $\mathbf{C}$  as falsity (contingency). Results are a 16-valued truth table in row-major and horizontal, or repeating fragments of 128-tables for more variables.

LET  $p, q, r, s$ : Probability, cat, radioactive decay, death;  
 $\sim$  Not;  $+$  Or;  $\&$  And;  $>$  Imply, greater than.

We paraphrase Schrödinger's cat thought experiment as follows.

A box hides from view a cat with a radioactive source where the probability of decay or *no* decay is equal. In the course of one hour, the probability of the state of decay causes the demise of the cat, or the probability of the state of *no* decay causes *not* the demise of the cat. (1.1)

$((p\&r)>(q\&s))+((p\&\sim r)\&(q\&\sim s))$  ;  $\mathbf{TTTT\ T\mathbf{F}\mathbf{T}\mathbf{F}\ T\mathbf{TTT}\ T\mathbf{F}\mathbf{T}\mathbf{T}}$  (1.2)

Superposition is defined as both states of Eq. 1.1 rather than either state of Eq. 1.1. (2.1)

$((p\&r)>(q\&s))\&((p\&\sim r)\&(q\&\sim s))$  ;  $\mathbf{F\mathbf{F}\mathbf{F}\mathbf{T}\ F\mathbf{F}\mathbf{F}\mathbf{F}\ F\mathbf{F}\mathbf{F}\mathbf{F}\ F\mathbf{F}\mathbf{F}\mathbf{F}}$  (2.2)

Quantum theory asserts that either state implies both states concurrently as superposition. (3.1)

$((((p\&r)>(q\&s))+((p\&\sim r)\&(q\&\sim s)))>(((p\&r)>(q\&s))\&((p\&\sim r)\&(q\&\sim s))))$  ;  $\mathbf{F\mathbf{F}\mathbf{F}\mathbf{T}\ F\mathbf{T}\mathbf{F}\mathbf{T}\ F\mathbf{F}\mathbf{F}\mathbf{F}\ T\mathbf{F}\mathbf{T}\mathbf{T}}$  (3.2)

As rendered, Eqs. 1.2, 2.2, and 3.2 are *not* tautologous. Therefore, Schrödinger's cat thought experiment is refuted. Furthermore, the definition of superposition in Eq. 2.2 is very nearly a contradiction, excepting one value for  $\mathbf{T}$  as tautology, and serves as a red herring in the schema.

**Remark:** The state inside the box during the hour at any moment is not known exactly, but that does not mean both states are concurrent at any moment as superposition. However, before the end of the hour to open the box, interrupt the experiment, and force an inspection returns either state in Eq. 1.2, and hence falsifies Eq. 2.2 as a concurrent state of affairs in Eq. 3.2.