n-Valued Refined Neutrosophic Logic and Its Applications to Physics FLORENTIN SMARANDACHE, University of New Mexico — The Neutrosophic Logic value of a given proposition has the values $T = $ *truth*, $I = $ *Indeterminacy, and $F = $ falsehood.* We have defined in 1995 two types of n-valued logic: symbolic and numerical:

- *The n-Symbol-Valued Refined Neutrosophic Logic.*

In general: T can be split into many types of truths: $T_1, T_2, ..., T_p$, and I into many types of indeterminacies: $I_1, I_2, ..., I_r$, and F into many types of falsities: $F_1, F_2, ..., F_s$,where all $p, r, s \geq 1$ are integers, and $p + r + s = n$. All subcomponents T_j, I_k, F_l are symbols for $j \in \{1,2,\ldots,p\}$, $k \in \{1,2,\ldots,r\}$, and $l \in \{1,2,\ldots,s\}$.

- *The n-Numerical-Valued Refined Neutrosophic Logic.*

In the same way, but all subcomponents T_j, I_k, F_l are not symbols, but subsets of *[0,1]*, for all $j \in \{1,2,\ldots,p\}$, all $k \in \{1,2,\ldots,r\}$, and all $l \in \{1,2,\ldots,s\}$.

- Remarks: A) Similar generalizations can be done for *n-Valued Refined Neutrosophic Set*, and respectively *n-Valued Refined Neutrosopjhic Probability.* B) n-Valued Refined Neutrosophic Logic is applied in physics in cases where two or three of <A>, <antiA>, and <neutA>simultaneously coexist, where <A>may be a physical item (object, idea, theorem, law, theory).

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