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Applications of Neutrosophic Quadruple Algebraic Structures FLORENTIN SMARANDACHE, University of New Mexico, A. A. A. AGBOOLA, Federal University of Agriculture of Abeokuta, B. DAVVAZ, Yazd University — A Neutrosophic Quadruple Number is a number of the form: NQ = a+bT+cI+dF, where a, b, c, d are real or complex numbers, while T = truth, I = indeterminacy, and F = falsehood. For each NQ, a is called the determinate part of NQ, while bT+cI+dE the indeterminate part of NQ. A Preference Law, with respect to T, I, F, we may define on the set of neutrosophic quadruple numbers. For example, let's say T <I <F. With respect to this preference law, we define the Absorbance Law for the multiplications of T, I, and F, in the sense that the bigger one absorbs the smaller one (or the big fish eats the small fish); for example: TT = T (T absorbs itself), TI = I (because I is bigger), FT = F (because F is bigger), and so on. The addition and subtraction of neutrosophic quadruple numbers are defined as: $(a_1+b_1T+c_1I+d_1F) + (a_2+b_2T+c_2I+d_2F) = (a_1+a_2) + (b_1+b_2)T+(c_1+c_{2)}I+(d_1+d_2)F$; $(a_1+b_1T+c_1I+d_1F) - (a_2+b_2T+c_2I+d_2F) = (a_1-a_2) + (b_1-b_2)T+(c_1-c_{2)}I+(d_1-d_2)F$. While multiplication $(a_1+b_1T+c_1I+d_1F)(a_2+b_2T+c_2I+d_2F)$ is defined as in classical multiplication of polynomials, but taking into consideration the above absorbance law when multiplying the T, I, F among themselves. Various neutrosophic quadruple algebraic structures and their applications are studied on the set of NQs.

Florentin Smarandache
University of New Mexico

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