Atangana introduces new fractional Beta-derivative

One of the most used mathematical concepts in modelling is perhaps "the concept of derivative", Dr Abdon Atangana said. The contemporary improvement of calculus is frequently attributed to Isaac Newton and Leibniz, who provided self-determining and unified approaches to differentiation and derivatives. Due to the complexity of the physical problems encountered in our daily basic, the concept of derivative has been modified.

The concept of fractional derivative was formulated by Riemann-Liouville (stet) and later modified by M Caputo. This concept has been used for modelling real world problems. However, these derivatives do not satisfy basic properties of the Newtonian concept, for instance the product, quotient and the Chain rules that are being taught to undergraduate students.

This issue has been a worry for researchers in the field of fractional calculus. To solve this problem, Dr Atangana introduced a fractional derivative called 'Beta-derivative' and its anti-derivative called 'Atangana-Beta integral'.

To test the efficiency and the accuracy of the derivative, he modelled the mitigation of contamination through aeration within a moving waterway polluted via dispersed bases together with connected reduction of liquefied oxygen. This paper is available online in the *Journal of Nonlinear Mechanics*. Dr Atangana used the derivative to construct a model describing the spread of the deathly Ebola virus.

This paper – 'Model of Break-Bone Fever via Beta-Derivatives', by Dr Atangana and a co-author – has been published online in the *Journal of BioMed Research International*, with an impact factor of 2.88. In another paper, Dr Atangana modified the groundwater flow equation using the proposed derivatives, the numerical simulations in comparison with Newtown and Caputo derivative let no doubt to believe that the proposed derivative is the future tool for modelling real world problems. This paper has been published online in the *Journal of Vibration and Control* with an impact factor of 4.355.