NUMERICAL SIMULATION OF LIGHT SCATTERING BY DENGUE INFECTED BLOOD

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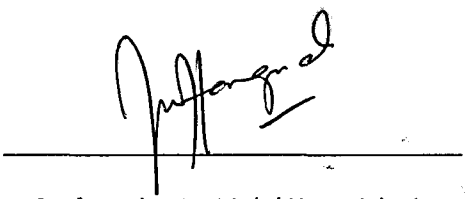

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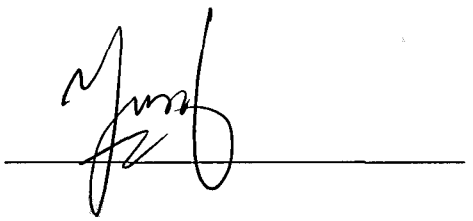

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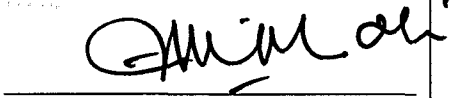

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ABSTRACT

NUMERICAL SIMULATION OF LIGHT SCATTERING BY DENGUE INFECTED BLOOD

The numerical simulation of light scattering by dengue infected blood is an investigation on the effects of electromagnetic wave's propagation and it's scattering in blood as the number of platelet and their states are varied. For normal blood condition, the number of platelet ranges from 147K/uL to 347 K/uL, but for dengue infected blood the number is reduced to below than 100K/uL, a condition called Thrombocytopenia. The simulation is done using COMSOL Multiphysics Time-Harmonic Finite-Element Method. The refractive index of platelet is taken as 1.85 and the blood background consisting of red blood cell and plasma is taken as 1.39. Plane wave is normally incident on platelets in blood .The incident radiation ranging from wavelength of 400nm to 1000nm is illuminated to the blood sample. Then, the normalized reflected and transmitted amounts of power are compared between the healthy and the dengue infected blood sample in different states of platelet. The result shows that both normalized transmitted and reflected coefficients varied at various wavelengths due to scattering by the number of platelets in blood sample. For activated platelet in the dengue infected blood, the normalized transmitted power increases with wavelength.