BISTATIC SCATTERING COMPUTATION FROM THE OBJECT WITH OBLATE SPHEROID FORM OF RAINDROP SHAPES ASSUMPTION

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There are some important matters in propagation electromagnetic, one of them is rain attenuation. Rain attenuation causes scattering and absorption on electromagnetic waves. The impacts arising from this phenomenon is the declining quality of communication that can be form weak signal reception, interference between channels on a dual polarization system, or interference from other communication systems that use the same spectrum region. Among all such communication system interference, attenuation is the most influential on the quality of communication, especially in the use of micro-wave and millimeter wave.

In this final project, will be simulated a raindrop with assumption oblate spheroid with the real of permittivity that is shot by electromagnetic wave. So that, it will obtain the value of bistatic scattering. First, will be simulated with assumption oblate spheroid raindrop shape. That will be validated later with the result of Shoji Asano. The next step is simulation of oblate spheroid raindrop shape will be compared with assumption prolate spheroid. The last step, complex permittivity will be used to oblate spheroid raindrop shape (a/b=2) to obtain value of scattering, absorption, and extinction cross section.

Based on the analysis of computational results with a frequency of 30 GHz, it is showed that the bigger size of the rain, value of the bistatic cross section will be greater. At incident angle is 0°, at k = 1 the value of bistatic cross section is -19.354 dB, k = 2 dB is -0.593 value
and $k = 5$ is 22.651 dB. Then, when validated by research of Shoji Asano, oblate spheroid raindrops form by the MGSLS method is not valid. After that, the complex permittivity will get the value of scattering, absorption and extinction cross section. Based on the frequency of oblate spheroid form, the larger frequency, value of the scattering cross section gets smaller but the value of absorption and extinction cross section increases. Meanwhile, if compared with other raindrops, based on the scattering, absorption and extinction cross section, rain attenuation of oblate spheroid form has the smallest value but the spherical has the greatest.

**Key word**: Rain attenuation, Scattering and absorption, Bistatic scattering computation, Oblate spheroid