

# National Conference

ON Advancement in Frontier Physics : from 20<sup>th</sup> Century to the Present



Organised By :

**DEPARTMENT of PHYSICS  
BHAIRAB GANGULY COLLEGE**



Certificate

This is to certify that Mrs. / Mr. / Dr. .... *Ayan Kanti Pradham* ..... of  
..... *A.P.C. College, KOL-131* ..... has  
participated / presented <sup>2</sup> papers in the seminar "National Conference on Advancement in  
Frontier Physics : from 20<sup>th</sup> Century to the Present" held on 26th & 27th February, 2016  
at Bhairab Ganguly College, Belghoria, Kolkata - 700056 in collaboration with  
Mrinalini Datta Mahavidyapith and in association with West Bengal State University.

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**Title : Ground based zenith looking radio visibility of a microwave radiometer at different microwave frequencies in Kolkata**

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Theoretical estimates of the millimeter wave attenuation due to atmospheric gases indicate that under clear weather condition (no rain or fog), the specific attenuation in dB/km exhibits minima around 35, 94, 140 and 220 GHz, which are called millimeter wave window. In between these windows there exist the maxima of attenuation due oxygen molecules. The maxima occurs around 60,118 GHz due to oxygen. At 22.235 GHz over Kolkata, the specific attenuation at surface is found to be about 0.6 dB/km. It has been presumably assumed that while looking towards the zenith from ground, a radiometer can look up to infinity. But that is not practically feasible. In order to study the height up to which a ground based radiometric attenuation (total integrated attenuation) takes approximately the saturation value, we define a term Radio visibility at different microwave frequencies in the oxygen band. In this regards this to be mentioned that the oxygen spectra ranging from 50 to 70 GHz seems to be more complex and attenuation is sizeable. Hence it needs a special attention as this band is generally used as temperature profiler. We have defined the radio visibility in the oxygen band as the height at which the variation of total attenuation is less than or equal to 0.1% of that of the immediate preceding slab, considering the thickness of each slab is equal to 10 meter and hence is the 99.9%