1. **Initialization and data import:**

Initialize number of azimuthal and elevation variation points (13,3), frequency limits (56-64 GHz) and import measurement data from csv file. Also scaling of the frequency axis is done and dB values are converted to absolute scale.

1. **Phase Regeneration from Magnitude data:**

Mag is calculated from power received data and Phase regeneration is done to evaluate the complex CTF.

Phase = modified Hilbert transform of Mag. + (2\*pi\*f\*d)/c; d: Distance between antennas.

Modified Hilbert is Hilbert [loge (|H(jw)|)].

Finally, channel CTF = |H(jw)| exp(j\*<H(jw))

1. **Conversion to time domain:**

We apply Inverse Fast Fourier Transform on the complex CTF with various Windowing processes (finally applying Hamming window) and generate the magnitude response in time domain, h(t).

1. **Peak detection and Calculation of RMS delay Spread:**

We first Generate PDP by squaring |h(t)|. Then the peaks are located for every combination and stored in another matrix. Then average delay spread and RMS delay spread are calculated for all the combinations and standard deviations are stored to analyze the variation in RMS delay spread in case of receiver misalignment.

1. **Tapped Delay Filter Line (TDL model):**

The TDL model represents the Multipath model of a channel which follows Rayleigh fading. The LoS component is detected in section 4 and then the PDP is sampled at uniform intervals so that no significant peak (generally the peak after LoS) is missed for any combination of (Azim, elev) , the gains of the samples multiplied by random coeffs (following Rayleigh criteria \*) and impulse function generates the tap values and then they are normalized by dividing all values wrt LoS tap value.

1. **Bit Error Rate:**

A number of bits is randomly generated (say 1Mbits) and modulated (say BPSK) and sampled at intervals of time (reciprocal of transmission speed say 50Mbits/s). The sampled data is convolved with the TDL model of the channel and then AWGN is added to it. Finally, the received bits are compared keeping 0 (for BPSK) as threshold for errors.

BER= No of erroneous bits / No of transmitted bits.

BER of all combinations needed to be found out and analyzed.

1. **Plots:**

* |H(f)| vs f plots and <H(f) vs f plots for all combinations
* PDP plots for all combinations.
* TDL model for all combinations
* BER vs SNR plot for different combinations at different speeds.