

Pengurangan bit error pada modulasi m-qam dalam kanal rayleigh fading dengan teknik spatial multiplexing dan metode zf-sic, mmse-sic, maximum likelihood = Bit error reduction on m-qam modulation in rayleigh fading channels with spatial multiplexing techniques and zf-sic, mmse-sic, maximum likelihood methods

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Abstrak

Sinyal yang diterima dari kanal komunikasi dengan modulasi M-QAM dapat berubah karena munculnya sejumlah bit yang salah (error). penyebab terjadinya bit error dapat berupa interferensi, seperti Rayleigh fading serta noise, seperti additive white gaussian noise (AWGN). pengurangan bit error pada modulasi M-QAM dapat digunakan dengan teknik spatial multiplexing disisi pengirim dan metode pendeteksian dan penerimaan sinyal di sisi penerima. terdapat beberapa penelitian yang dilakukan sebelumnya mengenai penerapan spatial multiplexing di sisi pengirim dan metode pendeteksian dan penerimaan sinyal di sisi penerima, seperti penelitian pada komunikasi CDMA dengan metode OSIC, ZF dan Maximum Likelihood. selain itu, terdapat penelitian tentang MMSE dan penelitian mengenai penerapan metode ZF-SIC pada modulasi BPSK.

Permasalahan yang kemudian dihadapi dan menjadi pokok bahasan dalam penulisan tesis ini adalah bagaimana memaksimalkan pengurangan bit error hingga 10^{-4} atau mendekati 0 agar sinyal yang diterima dapat Mediterranean kembali dengan benar. untuk itu dalam tesis ini diusulkan penggunaan teknik spatial multiplexing dengan metode pembatalan atau penekanan terus menerus sinyal interferensi yang terdapat pada sinyal yang diterima yang diistilahkan dengan succesive interference cancellation (SIC) pada metode ZF, MMSE, dan maximum likelihood serta lebih dimaksimalkan dengan menambahkan metode pemilihan sinyal gangguan terberat MRC.

The signal received from the communication channel with M-QAM modulation can change due to the appearance of a number of wrong bits (error). the cause of bit error can be interference, such as Rayleigh fading and noise, such as additive white gaussian noise (AWGN). bit error reduction in M-QAM modulation can be used with the spatial multiplexing technique on the sending side and the method of detecting and receiving signals on the receiving side. There have been several studies conducted previously regarding the application of spatial multiplexing on the sending side and the method of detecting and receiving signals on the receiving side, such as research on CDMA communication with OSIC, ZF and Maximum Likelihood methods. In addition, there are research on MMSE and research on the application of the ZF-SIC method on BPSK modulation.

The problem that is then faced and the subject of the discussion in writing this thesis is how to maximize the reduction of bit error up to 10^{-4} or close to 0 so that the signal received by Mediterranean can return correctly. Therefore, this thesis proposes the use of spatial multiplexing techniques by continuously canceling or suppressing the interference signals found on signals received which are termed as successful interference cancellation (SIC) in the ZF, MMSE, and maximum likelihood methods and more maximized by adding selection methods. MRC's heaviest signal interference.