



UCL Department of Computer Science
CS M038/GZ06: Mobile and Adaptive Systems

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One-pager: Interference Cancellation **Due: start of lecture, 6 February 2009**

Instructions: answer the following question as succinctly as possible in 200–500 words (roughly one double-spaced, typed page). **Your answer should be mostly written in your own words, and if you include passages from the paper, you must enclose them in quotation marks.** Shorter answers are preferred.

Suppose that at time t_1 , a weak transmitter sends a packet using QPSK modulation, and at the same time, a strong transmitter sends a packet using BPSK modulation. Then at time t_2 , both packets end (the QPSK packet contains twice the amount of data as the BPSK packet). With our discussion on 28th January of modulation and superposition of signals and noise in mind, draw a constellation diagram of the signal input to the wireless receiver between times t_1 and t_2 . Assume additive background noise of $1/8^{\text{th}}$ the power of each transmission is present.

List the steps the SIC receiver described in the paper takes to decode these packets. Include in your answer the constellation diagrams that the SIC receiver uses to demodulate, labeling the decision regions, decision boundaries, and bits decided upon as in Slide 7 of 28th January's lecture.