- For the Zero-Mean Gaussian System, $C^* = I(\mathbf{X}^*; \mathbf{Y}^*)$.

- For the alternative system, $I(\mathbf{X}^*; \mathbf{Y}) \leq C$.

- We will show that $I(\mathbf{X}^*; \mathbf{Y}^*) \leq I(\mathbf{X}^*; \mathbf{Y})$.

- Hence,
$$C^* = I(\mathbf{X}^*; \mathbf{Y}^*) \leq I(\mathbf{X}^*; \mathbf{Y}) \leq C.$$