Correlation function 2

$$\hat{C}_2(r) = \frac{1}{R} \sum_{k=1}^{R} \left(\frac{1}{L} \sum_{i=1}^{L} \sigma_i \sigma_{i+r} - \left(\frac{1}{L} \sum_{i=1}^{L} \sigma_i \right) \left(\frac{1}{R} \sum_{k=1}^{R} \sigma_{i+r} \right) \right)$$

