

Table S2: Relation between the  $\rho^*$ , configuration size and recall rate in regions with high amounts of LD. Recall rate indicates the percentage of times where we picked the true causal SNP in our configuration. The configuration size is the average number of SNPs which is predicated to be causal by our method. For each value of  $\rho^*$  we run the experiment for 1000 times.

$\rho^*$	Configuration Size	Recall Rate(%)
0.5	$2.149402 \pm 1.047566$	62.94821
0.55	$2.408348 \pm 1.241056$	70.96189
0.6	$2.663462 \pm 1.532$	75.96154
0.65	$2.921642 \pm 1.452493$	79.29104
0.7	$3.28839 \pm 1.716047$	81.64794
0.75	$3.64497 \pm 2.10312$	86.39053
0.8	$3.978102 \pm 2.067303$	89.59854
0.85	$4.684601 \pm 2.73976$	93.32096
0.9	$5.121377 \pm 2.78669$	96.37681
0.95	$6.598058 \pm 3.598475$	98.83495