



**Figure S3** Randomly sampled profile LOD plots for trait pairs simulated with interlocus distance equal to 0.5 cM, effect size 1, and allele partitioning F:ABCDEFGH. The test statistics, by row, starting at the top and proceeding left to right, are: 0.10, 0.22, 0.33, 0.36, 0.43, 0.59, 0.71, 1.06, and 1.37. The critical value (for  $\alpha = 0.05$ ) is 0.77.