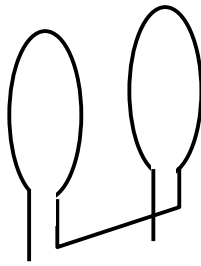
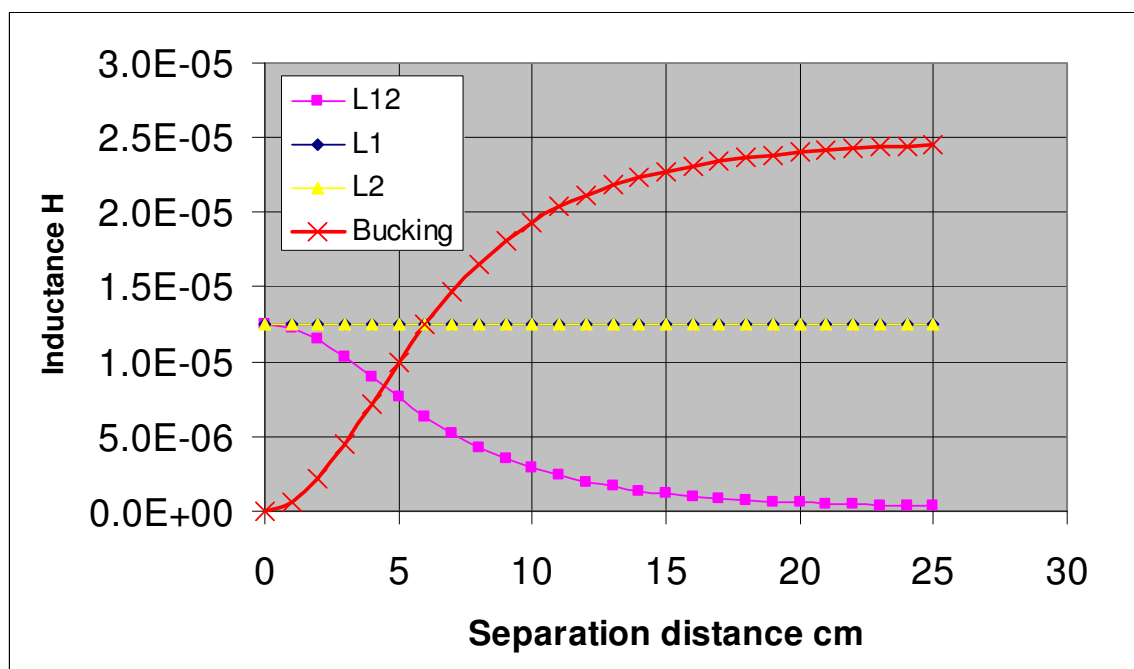


Some pointers towards optimum separation distance

Taking two single turn loops L1 and L2 each 10 cm diameter and arranged as follows.

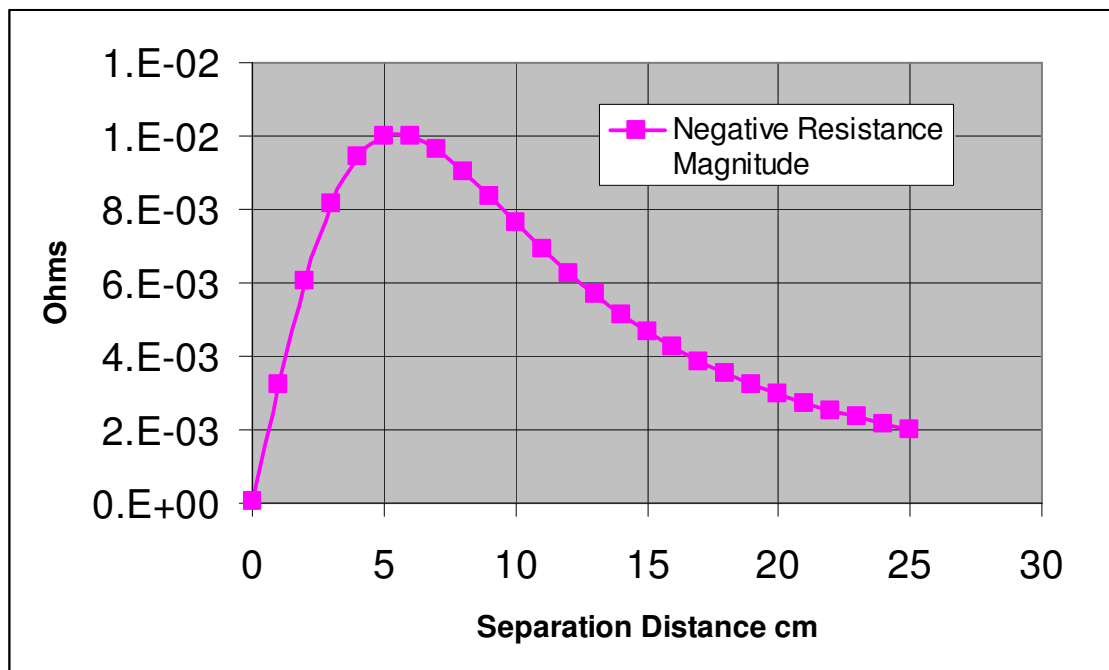


The following chart shows their individual inductances, their mutual inductance L12 and their series inductance in bucking mode plotted against separation distance.



The mutual inductance L12 is equal to L1 (and L2 since $L1=L2$) at zero separation then reduces with separation distance to become zero at large separation. The overall inductance of the loops connected in series bucking mode is zero at zero separation then rises to reach $2*L1$ at large separation where we then have two non-coupled inductors in series. This is for loops in air, but coils on a ferrite rod should offer a similar pattern.

The next chart shows the induced negative resistance when there is significant magnetic propagation delay across the separation gap.



The resistance values shown here are arbitrary but the important thing to note is the shape of the curve. The actual values will depend on the frequency of operation and the magnetic propagation velocity but the shape of the curve and the position of the peak remain the same. Thus the optimum separation required for maximum negative R is seen to be 5cm in this case, i.e. half the diameter. For coils mounted on ferrite rods something similar should occur.