Trevor J Hoglund

When the magnet is at the top of the tube, the magnet field at the coil is essentially zero; as we drop the north end down, the magnetic field will be increasingly negative (pointing downward). At the moment when the magnet is at the center of the coils, such that the south end is above and the north below the coils, the magnetic field will be instantaneously zero, then proceed to become positive, then approach zero once more. When the field is negative, the induced current will flow clockwise, and the positive field will induce a counterclockwise current. Since the coils wrap around the tube clockwise going downward, the connect to the negative terminal, the clockwise current induced by the north pole of the magnet will show a negative spike, then the south pole will show a positive spike. We dropped the magnet with the red marked side downward, and the graph showed a negative spike followed by a positive spike, therefore the red marked end is the north pole of the magnet.