

The MEMS gyroscopes provide angular velocity measurements by using the displacement of resonating masses. The displacement of the masses increases with increased angular velocity due to the Coriolis effect, which generates a force perpendicular to the vibrating masses. The Coriolis effect creates a 'force' on the masses due to the fact they are moving with a velocity on a rotating frame of reference (object the gyroscope is on), with respect to an inertial frame that isn't moving (space). Due to the changing displacement, capacitors can be fitted to measure the gap by outputting a difference in voltages. These voltages can be amplified and mapped to an angular velocity to get measurements out of the gyroscope.

The tradeoff between sensitivity and range is an inverse relationship. If you were to increase one, the other would decrease. For this kind of sensor, it is likely using the difference in voltage between two capacitors to make the measurement. Therefore, if the capacitance was increased, the range would decrease as a higher voltage difference would be seen for smaller angular velocities, and therefore the sensitivity would have increased.