

5.4.10: Bubble Inside a Uniform Solid Sphere

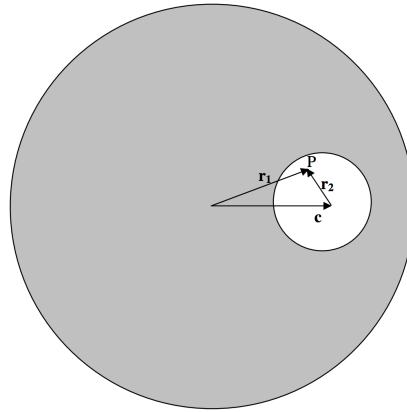


FIGURE V.11

P is a point inside the bubble. The field at P is equal to the field due to the entire sphere minus the field due to the missing mass of the bubble. That is, it is

$$\mathbf{g} = -\frac{4}{3}\pi G\rho\mathbf{r}_1 - \left(-\frac{4}{3}\pi G\rho\mathbf{r}_2\right) = -\frac{4}{3}\pi G\rho(\mathbf{r}_1 - \mathbf{r}_2) = -\frac{4}{3}\pi G\rho\mathbf{c}. \quad (5.4.26)$$

That is, the field at P is uniform (i.e. is independent of the position of P) and is parallel to the line joining the centres of the two spheres.

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