4. GRAVITY METHODS

Detect changes in
density according
to Newton's Law
of gravitational
attraction

$$g = \frac{F}{M_2} = \frac{GM_e}{R^2}$$
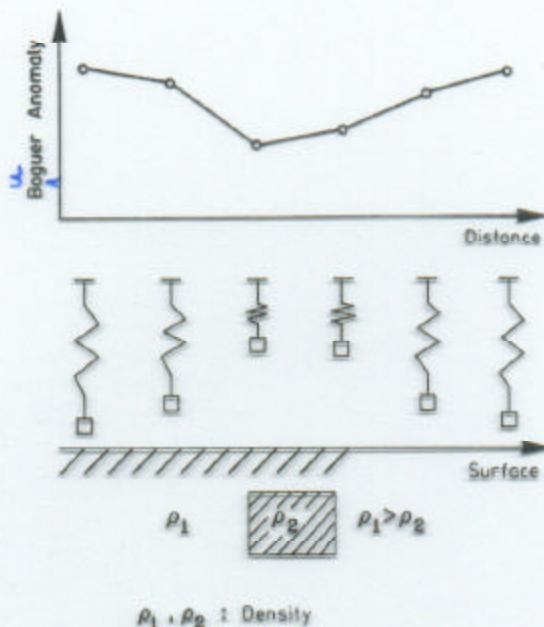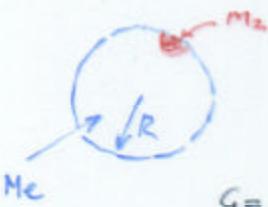

Fig. 2.23. Principle of gravity measurements

ρ_1 , ρ_2 : Density

$G =$ gravitational constant 6.67×10^{8} degree $\frac{cm^2}{g^2}$

$g =$ grav. accn.

Gravimeters measure variation in $g = 9.8 \, m/s^2$ of $10^{-5} \, m/s^2$

Gravity depends on:
1. Latitude (Non-perfect sphere) ⬭
2. Elevation (R)   [Free air correction]
3. Topography (m_2)   [Terrain correction]
4. Earth tides   [Isostatic correction]
5. Density variation in subsurface [Bouguer correction]

Density is the only important factor in gravity measurements,
but effect is much less than all other factors

Limited applicability to Environmental Surveys:
1. Small signal
2. High cost.