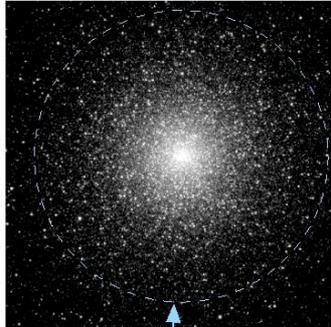


Illustration zum Nachweis der Gültigkeit des Virialsatzes

Virialsatz - allgemein
M15



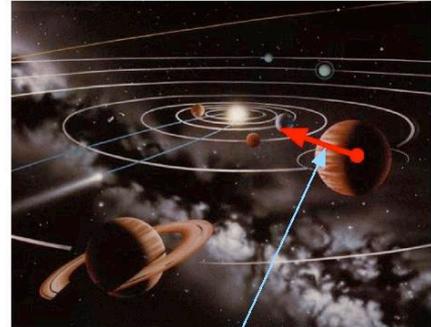
$$\overline{E_{\text{kin}}}, \overline{E_{\text{pot}}}$$

Virialsatz - Sonderfall
Planet Jupiter



$$E_{\text{kin}}, E_{\text{pot}}$$

Kräftegleichheit
Planet Jupiter



$$F_G = F_Z$$

$$\overline{E_{\text{kin}}} = -\frac{1}{2} \overline{E_{\text{pot}}} \Rightarrow$$

$$E_{\text{kin}} = -\frac{1}{2} E_{\text{pot}}$$

$$\Downarrow E_{\text{kin}} = \frac{m}{2} \cdot v^2$$

$$\Downarrow E_{\text{pot}} = -\gamma \cdot M \cdot m \cdot \left(\frac{1}{r}\right)$$

$$\frac{m}{2} \cdot v^2 = \frac{1}{2} \cdot M \cdot m \cdot \left(\frac{1}{r}\right)$$

$$\Rightarrow \gamma \cdot \frac{M \cdot m}{r^2} = \frac{m \cdot v^2}{r}$$

$$F_G = F_Z$$