

$$\hat{H}\hat{A}$$

$$\frac{d}{dt}\hat{A}_H=\left(\frac{\partial \hat{A}}{\partial t}\right)_H+\frac{1}{i\hbar}\left[\hat{A}_H,\hat{H}\right]$$

$$\stackrel{(1)}{H\hbar}[\cdot,\cdot]$$

$$\frac{d}{dt}\langle\hat{A}\rangle=\left\langle\frac{\partial\hat{A}}{\partial t}\right\rangle+\frac{1}{i\hbar}\langle[\hat{A},\hat{H}]\rangle$$

$$\stackrel{(2)}{\frac{d}{dt}\langle A\rangle}=\left\langle\frac{\partial A}{\partial t}\right\rangle+\langle\{\{A,H\}\}\rangle$$

$$\stackrel{(3)}{\begin{array}{c} \hat{A} \\ \hat{H} \\ \hat{A} \\ \hat{H} \\ \langle A \rangle \\ \hat{A} \\ \langle \hat{A} \rangle \\ \{\{ \cdot, \cdot \} \} \end{array}}$$

$$\{\{f,g\}\}=\frac{2}{\hbar}f\sin\left[\frac{\hbar}{2}\left(\sum_i\overleftarrow{\partial}_{q_i}\overrightarrow{\partial}_{p_i}-\overleftarrow{\partial}_{p_i}\overrightarrow{\partial}_{q_i}\right)\right]g$$

$$\stackrel{(4)}{f\over g}_{i\{q_i\}\{p_i\}}$$

$$H=\frac{p^2}{2m}+V(q)$$

$$\stackrel{(5)}{m_{\text{???}}}$$

$$\frac{d}{dt}\langle A\rangle=\left\langle\frac{\partial A}{\partial t}\right\rangle+\langle\{A,H\}\rangle+\sum_{k=1}^{\infty}\frac{(-1)^{k+1}\hbar^{2k}}{(2k+1)!2^{2k}}\left\langle A_p^{(2k+1)}V_q^{(2k+1)}\right\rangle$$

$$\stackrel{(6)}{\begin{array}{l} A_p^{(i)}=\\ \partial^i A/\partial p^i\\ V_q^{(i)}=\\ \partial^i V/\partial q^i \end{array}}$$

$$\{f,g\}=\frac{\partial f}{\partial q}\frac{\partial g}{\partial p}-\frac{\partial f}{\partial p}\frac{\partial g}{\partial q}$$

$$\stackrel{(7)}{\begin{array}{c} \hbar A \\ V_{??}A \\ \hat{A} \\ \hat{p} \end{array}}$$

$$\frac{d}{dt}\langle q\rangle=\frac{1}{m}\langle p\rangle$$

$$\stackrel{(8)}{\frac{d}{dt}\langle p\rangle}=-\left\langle V_q^{(1)}\right\rangle$$

$$\stackrel{(9)}{\begin{array}{l} ??\langle V_q^{(1)}\rangle \\ \frac{d}{dt}\left\langle V_q^{(1)}\right\rangle=\frac{1}{m}\left\langle V_q^{(2)}p\right\rangle \end{array}}$$

$$\stackrel{(10)}{\langle V_q^{(2)}p\rangle}$$

$$\stackrel{(11)}{\frac{d}{dt}\left\langle V_q^{(2)}p\right\rangle}=\frac{\left\langle V_q^{(3)}p^2\right\rangle}{m}-\left\langle V_q^{(1)}V_q^{(2)}\right\rangle$$

$$\stackrel{????}{M}$$

$$/V^{(3),2}\backslash$$

$$\begin{array}{l} 1????M>\\ \tilde{\mu}_q=\\ \langle q\rangle\mu_p=\\ \langle p\rangle\sigma_q=\\ \sqrt{\langle (q-\mu_q)^2\rangle}\\ \sigma_p=\\ \sqrt{\langle (p-\mu_p)^2\rangle}\\ \tilde{q}=\\ (q-\mu_q)/\sigma_q\\ \tilde{p}=\\ (p-\mu_p)/\sigma_p\\ \tilde{q}^i\tilde{p}^j\\ q^ip^j\xi_{ij}=\\ \langle \tilde{q}^i\tilde{p}^j\rangle\\ \xi_{00}=\\ 1,\xi_{10}=\\ \xi_{01}=\\ 0\\ \xi_{20}=\\ \xi_{02}=\\ 1???{\tilde{q}}\\ V\end{array}$$

$$\begin{array}{l} V(\tilde{q})=\sum_{k=0}^Mb_k\tilde{q}^k\\ (16)\\ b_k=\\ \sum_{l=k}^MC_l^k\mu_q^{l-k}\sigma_q^ka_l\\ C_n^m=\\ m!/[n!(m-\\ n)!]??\end{array}$$

$$(17)\quad \frac{d}{dt}\mu_q=\frac{\mu_p}{m}$$

$$(18)\quad \frac{d}{dt}\mu_q=\frac{\mu_p}{m}$$

$$(19)\quad \frac{d}{dt}\sigma_q=\frac{\sigma_p\xi_{11}}{m}$$

$$(20)\quad \frac{d}{dt}\sigma_p=\chi$$

$$\begin{array}{l} \frac{d}{dt}\xi_{ij}=\alpha\xi_{ij}+\beta\xi_{i-1,j+1}+\gamma\xi_{i,j-1}+\sum_{k=0}^K\sum_{j=1}^M\eta_{kl}\xi_{i-2k-1+l+j-2k-1}\\ (21)\end{array}$$

$$\begin{array}{l} \{\alpha=\\ -j\chi/\sigma_p-\\ i\xi_{11}\sigma_p/(m\sigma_q),\\ \beta=\\ i\sigma_p/(m\sigma_q)\,,\\ \gamma=\\ -j\lambda/\sigma_p,\\ \eta_{kl}=\\ (-1)^{k+1}b_l\hbar^{2k}C_j^{2k+1}A_l^{2k+1}/\left(2^{2k}\sigma_p^{2k+1}\sigma_q^{2k+1}\right)\,,\\ \lambda=\\ -\sum_{k=1}^Mkb_k\xi_{k-1,0}/\sigma_q,\\ \chi=\\ -\sum_{k=1}^Mkb_k\xi_{k-1,1}/\sigma_q\\ A_n^m=\\ m!/(m-\\ n)!\\ K\\ (\min\{j,M\}-\\ 1)/2???i+\\ j\xi_{ij}\\ \xi_{kl}\\ i+\\ j+\\ M-\\ 2\\ M>\\ 2????NP_N(q,p)P_N(q,p)P_N(q,p)\end{array}$$

$$P_N(q,p)=\sum\quad c_{kl}f_{kl}(q,p)$$