





QUANTUM ESPRESSO















$\hbar$

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$2M\omega_{qv}$

1/2





$$dV_{SCF}$$


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$$d\hat{u}_{qv}$$







$d^3k$

---

$\Omega_{BZ}$



$$\gamma_{qv}$$


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$$\pi \hbar N(e_F) \omega_{qv}^2$$

$$1$$



$$2\pi N(e_F)$$



$\gamma_{qv}$



$\hbar\omega_{qv}$

$$\alpha^2 F(\omega)$$


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$$\omega$$





$$-1.04(1+\lambda)$$

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$$\lambda(1-0.62\mu^*)-\mu^*$$





$\omega \log$



1.2





dw

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w

