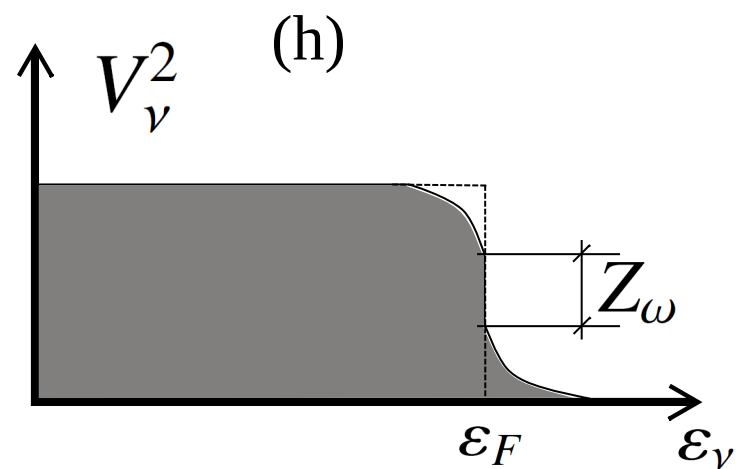
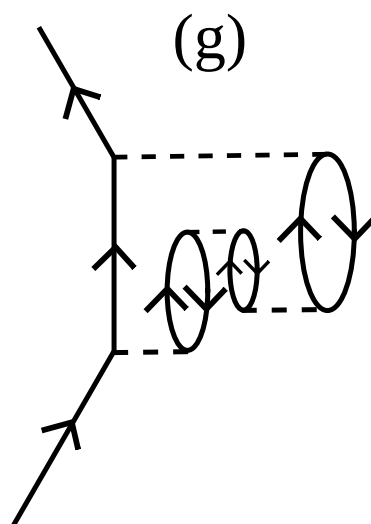
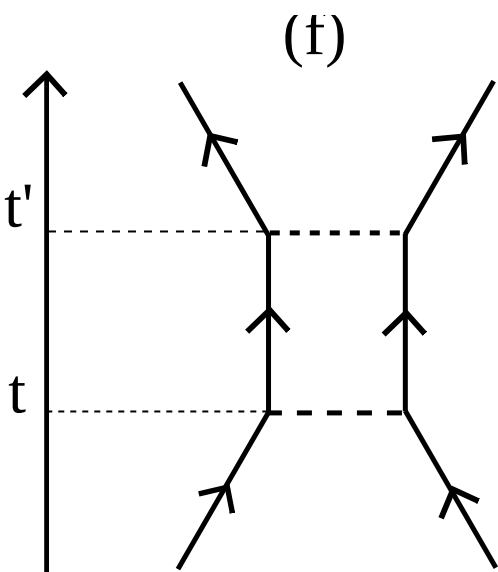
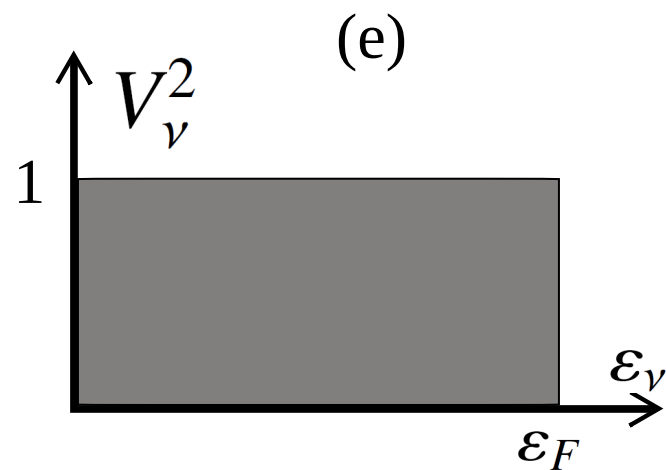


(d)
$$U(r) = \int d\mathbf{r} \rho(r') v(|\mathbf{r} - \mathbf{r}'|)$$

(d')
$$U_x(r, r') = - \sum_{i(\epsilon_i < \epsilon_F)} \varphi_i^*(\mathbf{r}') v(|\mathbf{r} - \mathbf{r}'|) \varphi_i(\mathbf{r})$$



(i)
$$\delta U(r) = \int d\mathbf{r} \delta \rho(r') v(|\mathbf{r} - \mathbf{r}'|)$$