

# Modern Quantum Chemistry, Szabo & Ostlund

## HW

WSF

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## 7 The 1-Particle Many-body Green's Function

### 7.1 Green's Function in Single-Particle Systems

**Ex 7.1**

$$\mathbf{V} = \mathbf{G}_0(E)^{-1} - \mathbf{G}(E)^{-1} \quad (7.1.1)$$

thus

$$\begin{aligned} \mathbf{G}_0(E)\mathbf{V}\mathbf{G}(E) &= \mathbf{G}_0(E)[\mathbf{G}_0(E)^{-1} - \mathbf{G}(E)^{-1}]\mathbf{G}(E) \\ &= \mathbf{G}(E) - \mathbf{G}_0(E) \end{aligned} \quad (7.1.2)$$

i.e.

$$\mathbf{G}(E) = \mathbf{G}_0(E) + \mathbf{G}_0(E)\mathbf{V}\mathbf{G}(E) \quad (7.1.3)$$

**Ex 7.2**