

$$h_z^\pm = \phi_z^\pm \Big|_{\mathbb{R}} \overset{\diamond}{h} \phi_z^\pm = \phi_z^\pm \phi_z^{*\pm} \Big|_{\mathbb{R}} \overset{\diamond}{h} = \overbrace{\phi_z^\pm \phi_z^\pm}^W \Big|_{\mathbb{R}_2} h$$

$$\frac{a}{c} \Big| \frac{b}{d} \ltimes h_z^\pm = h_{az + b/cz + d}^\pm$$