

A general transformation is

$$\Phi = \psi^{\tilde{A}} \xi_{\tilde{A}} \rightarrow \Phi' = \mathbf{R} \Phi \mathbf{S} = \psi^{\tilde{A}} \xi'_{\tilde{A}} = \psi^A L_A^B \xi_B = \psi'^B \xi_B$$

where

$$\xi'_{\tilde{A}} = \mathbf{R} \xi_{\tilde{A}} \mathbf{S} = L_{\tilde{A}}^{\tilde{B}} \xi_{\tilde{B}}, \quad \psi'^{\tilde{B}} = \psi^{\tilde{A}} L_{\tilde{A}}^{\tilde{B}}$$

The transformation from the left,

$$\Phi' = \mathbf{R} \Phi$$

reshuffles the components within each left ideal, whereas the transformation from the right,

$$\Phi' = \Phi \mathbf{S}$$

reshuffles the left ideals.

Active transformation

$$\tilde{A} \equiv \alpha i$$

$$\alpha = 1, 2, 3, 4$$

$$i = 1, 2, 3, 4$$

