

# Formula

mwli

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## 1 axis mode

### 1.1

$$e_i \xrightarrow{GT} \tilde{e}_i \xrightarrow{\pi_2} (x_i, y_i)$$

### 1.2

$$\begin{array}{ccccc} e_i & \xrightarrow{GT} & \tilde{e}_i & \xrightarrow{\pi_2} & (x_i, y_i) \\ \downarrow id & & & & \downarrow \Delta \\ e_i & \xrightarrow{GT^{(new)}} & \tilde{e}_i^{(new)} & \xrightarrow{\pi_2} & (x_i^{(new)}, y_i^{(new)}) \end{array}$$

### 1.3

$$\begin{array}{ccccc} e_i & \xrightarrow{GT} & \tilde{e}_i & \xrightarrow{\pi_2} & (x_i, y_i) \\ \downarrow id & & \downarrow \tilde{\Delta} & & \downarrow \Delta \\ & & \tilde{e}_i + (dx, dy, 0, 0, \dots) & \xrightarrow{\pi_2} & (x_i + dx, y_i + dy) \\ & & \downarrow normalize & & \vdots \approx \\ e_i & \xrightarrow{GT^{(new)}} & \tilde{e}_i^{(new)} & \xrightarrow{\pi_2} & (x_i^{(new)}, y_i^{(new)}) \end{array}$$

## 2 data point mode: 2-subspace rotation

### 2.1

$$\begin{array}{ccccc}
 c & \xrightarrow{GT} & \tilde{c} & \xrightarrow{\pi_2} & (x_c, y_c) \\
 \downarrow id & & \downarrow \tilde{\Delta} & & \downarrow \Delta \\
 & \searrow \rho & \tilde{c} + \tilde{\Delta} & \xrightarrow{\pi_2} & (x_c + dx, y_c + dy) \\
 & & \downarrow normalize & & \vdots \approx \\
 c & \xrightarrow{GT^{(new)}} & \tilde{c}^{(new)} & \xrightarrow{\pi_2} & (x_c^{(new)}, y_c^{(new)})
 \end{array}$$