2. wave correct (horizontal)

$\{R\} \rightarrow$ new $\{R\}$

① $R=\begin{pmatrix} r_1^T \\ r_2^T \\ r_3^T \end{pmatrix}$

② $\left(\Sigma r_1 r_1^T\right) r_y = 0 \Rightarrow r_y$

③ $r_y \times (\Sigma r_3) \rightarrow r_x$

④ $r_x \times r_y \rightarrow r_2$

⑤ $s := \Sigma (r_x \cdot r_1)$

if $s<0$

$r_x \leftarrow -r_x$

$r_y \leftarrow -r_y$

⑥ let $R_{ca}=\begin{pmatrix} r_x^T \\ r_y^T \\ r_z^T \end{pmatrix}$

$\therefore R_{ca}\{R\} \rightarrow I, \{RR_{ca}^{-1}\}$

1. detect wave direction

① let $R=\begin{pmatrix} r_1^T \\ r_2^T \\ r_3^T \end{pmatrix}$, $x=K(Rt)\begin{pmatrix} X \\ 1 \end{pmatrix}$

② $\because R=R_{w\rightarrow c}$

$\therefore R_{c\rightarrow w}\begin{pmatrix} 0 \\ 0 \\ 1 \end{pmatrix} = R^T\begin{pmatrix} 0 \\ 0 \\ 1 \end{pmatrix}$

$=(r_1\ r_2\ r_3)\begin{pmatrix} 0 \\ 0 \\ 1 \end{pmatrix}$

$=r_3$

③ use $\{r_3\}$ to detect wave direction, here r_3 is homogeneous.