– DEFECT FOR

$$Q: \begin{tikzcd} \underset{2}{\circ} \arrow[r, shift left, "\alpha"] \arrow[r, shift right, "\beta"'] & \underset{1}{\bullet} \end{tikzcd}$$

$$\delta = (\delta_2, \delta_1) = (1,1) = \underset{(1,2)}{\underline{\dim} P(2)} - \underset{(0,1)}{\underline{\dim} P(1)} \quad \& \quad \langle \underline{\dim} P(i), x \rangle = x_i$$

$$\langle \delta, x \rangle = \delta_1 x_1 + \delta_2 x_2 - 2\delta_2 x_1 = x_2 - x_1$$

– PREPROJECTIVE REPRESENTATIONS, DIM. VECTORS

$$\underline{\dim} P(1) = 01 \overset{c^{-1}}{\rightsquigarrow} 23 \rightsquigarrow 45 \rightsquigarrow 67 \rightsquigarrow 89 \rightsquigarrow \cdots$$

$$\underline{\dim} P(2) = 12 \overset{c^{-1}}{\rightsquigarrow} 34 \rightsquigarrow 56 \rightsquigarrow 78 \rightsquigarrow \cdots$$

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c^{-1}, $\underline{\dim} I(i) \longmapsto -\underline{\dim} P(i)$

$(1,0) \longmapsto (-1,-2)$

$(2,1) \longmapsto (0,-1)$

$(0,1) \longmapsto (2,3)$

$P_n :=$ PREPROJECTIVE WITH $\underline{\dim} P_n = (n, n+1)$, $n \geq 0$

$P_0 = P(1)$, $P_1 = P(2)$, ...

- PREPROJ.

OVER $2 \rightrightarrows 1$ CONTINUED:

- P_n WITH $\underline{\dim}\, P_n = (n, n+1)$, $n \geq 0$

- P_n: $K^n \underset{\begin{pmatrix} 0 & \cdots & 0 \\ 1 & & \\ & \ddots & \\ & & 1 \end{pmatrix}}{\overset{\begin{pmatrix} 1 & & \\ & \ddots & \\ & & 1 \\ 0 & \cdots & 0 \end{pmatrix}}{\rightrightarrows}} K^{n+1}$ EXERCISE: THIS IS INDECOMPOSABLE!

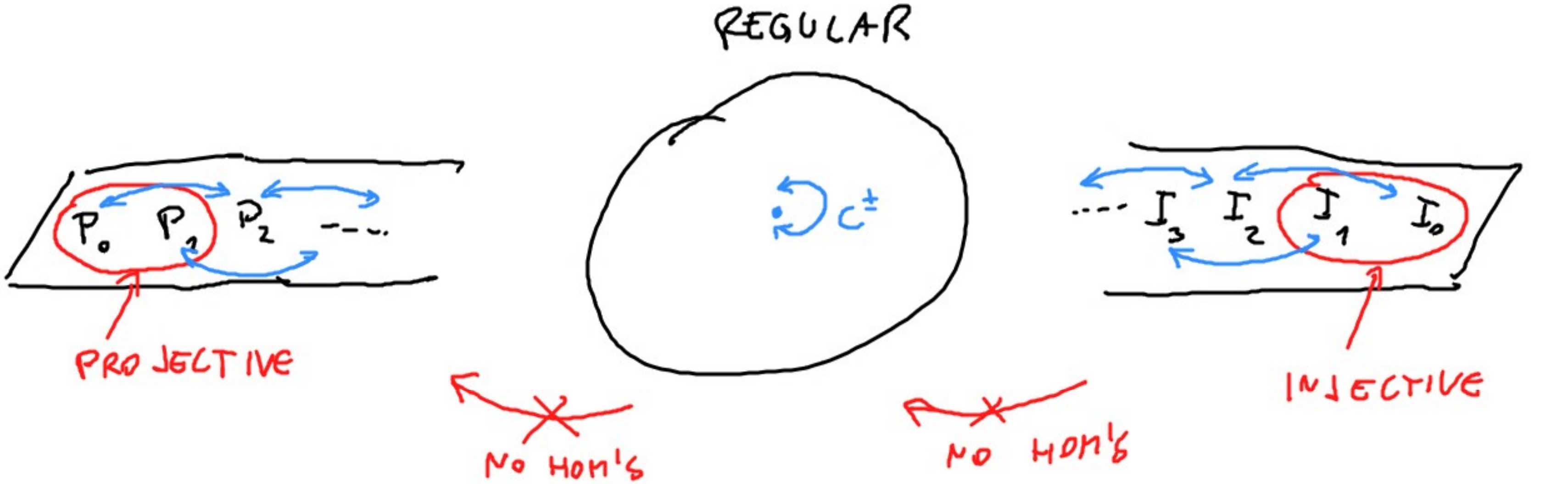
- PREINJECTIVES:

- I_n WITH $\underline{\dim}\, I_n = (n+1, n)$, $n \geq 0$

- I_n: $K^{n+1} \underset{\begin{pmatrix} 0 & 1 & & \\ \vdots & & \ddots & \\ 0 & & & 1 \end{pmatrix}}{\overset{\begin{pmatrix} 1 & & & 0 \\ & \ddots & & \vdots \\ & & 1 & 0 \end{pmatrix}}{\rightrightarrows}} K^n$ AGAIN INDECOMPOSABLE!

$\mathrm{Hom}(P_n, P_m) \neq 0$ ONLY IF $n \leq m$

ind $k(\bullet \rightrightarrows \bullet)$



$C^+ \longleftrightarrow C^-$

$C^+ \longleftrightarrow C^-$

$$C^+ P_n = P_{n-2}$$

$$C^- P_n = P_{n+2}$$

$$C^+ I_n = I_{n+2}$$

$$C^- I_n = I_{n-2}$$