

$$\mathbb{T}^d \begin{array}{c} \triangleleft \\ \infty \\ \triangleleft \end{array} \mathbb{C} \otimes \mathbb{C} \otimes \mathbb{T}^d \xrightarrow{\quad \wr \quad} {}_d\mathbb{Z} \begin{array}{c} \triangleleft \\ -m \\ \triangleleft \end{array} \mathbb{C} \otimes \mathbb{C} \otimes {}_d\mathbb{Z}$$

$$\begin{array}{c} \downarrow \\ \check{\Theta} | \mathbb{T}^d \\ \triangleleft \\ m \\ \triangleleft \end{array} \mathbb{C} \xrightarrow{\quad \wr \quad} \check{\Theta} | {}_d\mathbb{Z} \begin{array}{c} \triangleleft \\ 2 \\ \triangleleft \end{array} \mathbb{C}$$

$$\mathbb{T}^d \begin{array}{c} \triangleleft \\ 0 \\ \triangleleft \end{array} \mathbb{C} \otimes \mathbb{C} \otimes \mathbb{T}^d \xrightarrow{\quad \wr \quad} {}_d\mathbb{Z} \begin{array}{c} \triangleleft \\ m \\ \triangleleft \end{array} \mathbb{C} \otimes \mathbb{C} \otimes {}_d\mathbb{Z}$$

$$\begin{array}{c} \downarrow \\ \check{\Theta} | \mathbb{T}^d \\ \triangleleft \\ m \\ \triangleleft \end{array} \mathbb{C} \xrightarrow{\quad \wr \quad} \check{\Theta} | {}_d\mathbb{Z} \begin{array}{c} \triangleleft \\ 2 \\ \triangleleft \end{array} \mathbb{C}$$

$$\begin{array}{ccccccc} \mathbb{T}^d \begin{array}{c} \triangleleft \\ 0 \\ \triangleleft \end{array} \mathbb{C} & \xrightarrow{\quad \sqsubset \quad} & \mathbb{T}^d \begin{array}{c} \triangleleft \\ \infty \\ \triangleleft \end{array} \mathbb{C} & \xrightarrow[\text{multiplier } M]{} & \check{\Theta} | \mathbb{T}^d \begin{array}{c} \triangleleft \\ m \\ \triangleleft \end{array} \mathbb{C} & \xleftarrow[\text{convolutor } C]{} & \mathbb{C} \begin{array}{c} \triangleleft \\ -m \\ \triangleleft \end{array} \mathbb{T}^d & \xleftarrow{\quad \sqsupset \quad} & \mathbb{C} \begin{array}{c} \triangleleft \\ m \\ \triangleleft \end{array} \mathbb{T}^d \\ \downarrow \wr & & \downarrow \wr & & \downarrow \wr & & \downarrow \wr & & \downarrow \wr \\ {}_d\mathbb{Z} \begin{array}{c} \triangleleft \\ m \\ \triangleleft \end{array} \mathbb{C} & \xrightarrow{\quad \sqsubset \quad} & {}_d\mathbb{Z} \begin{array}{c} \triangleleft \\ -m \\ \triangleleft \end{array} \mathbb{C} & \xrightarrow[\hat{M}]{\text{co-convolutor}} & \check{\Theta} | {}_d\mathbb{Z} \begin{array}{c} \triangleleft \\ 2 \\ \triangleleft \end{array} \mathbb{C} & \xleftarrow[\hat{C}]{\text{co-multiplier}} & \mathbb{C} \begin{array}{c} \triangleleft \\ \infty \\ \triangleleft \end{array} \mathbb{Z} & \xleftarrow{\quad \sqsupset \quad} & \mathbb{C} \begin{array}{c} \triangleleft \\ * \\ \triangleleft \end{array} \mathbb{Z} \end{array}$$

$$\begin{array}{ccc}
\mathbb{T}^d \triangleleft_m^2 \mathbb{C} & \xleftarrow[l_u]{f \otimes_{\#}^{\infty} \varphi \otimes^{\infty}} & \mathbb{T}^d \triangleleft_m^2 \mathbb{C} \\
\downarrow \wr & & \downarrow \wr \\
{}_d\mathbb{Z} \triangleleft^2 \mathbb{C} & \xleftarrow[\varphi \otimes^1]{u^{\#}} & {}_d\mathbb{Z} \triangleleft^2 \mathbb{C}
\end{array}$$

$$\varphi \otimes_{\#}^1 \xi_{\alpha} = \sum_{\beta \in {}_d\mathbb{Z}} \varphi_{\alpha - \beta} \xi_{\beta}$$