footnote

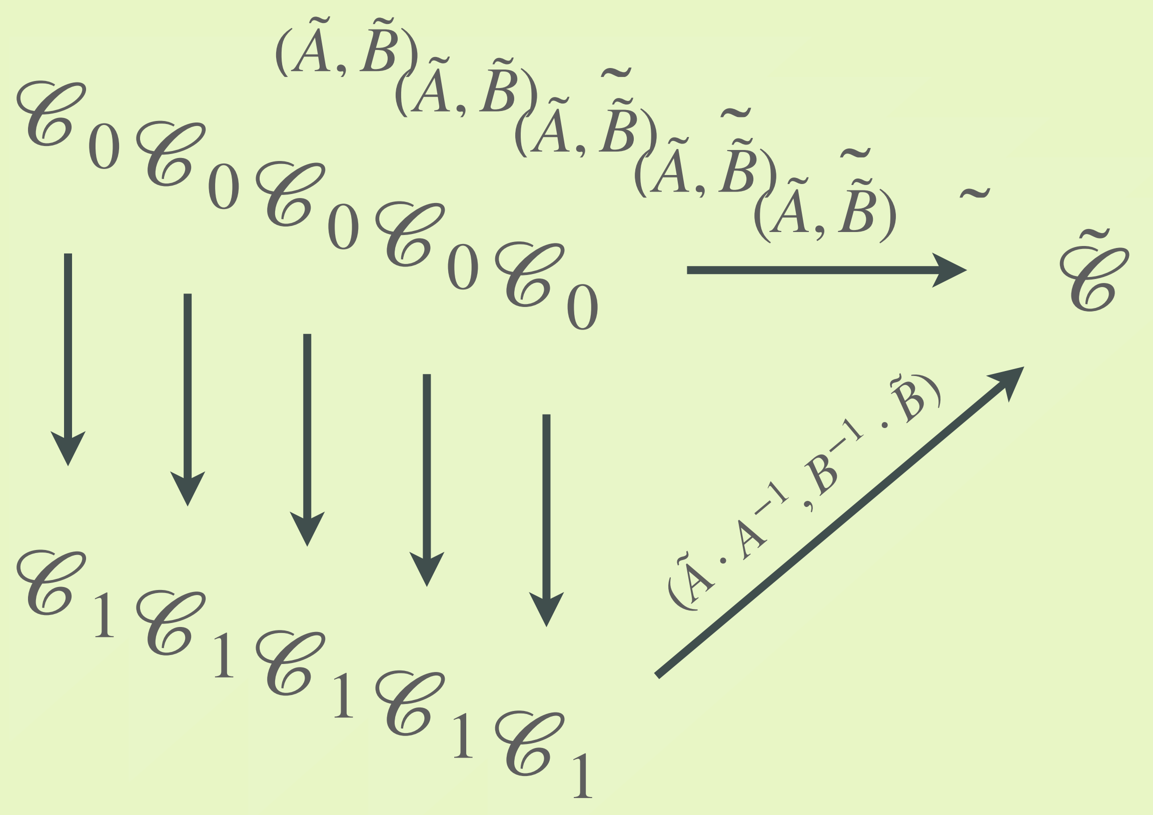
2

From MCE to MEDS

naive approach

$$\begin{tikzcd}
\mathscr{C}_0 \arrow[r, "(\tilde{A}, \tilde{B})"] \arrow[d, "(A, B)"'] & \tilde{\mathscr{C}} \\
\mathscr{C}_1 \arrow[ur, "(\tilde{A} \cdot A^{-1}, B^{-1} \cdot \tilde{B})"] &
\end{tikzcd}$$

repeat t times



1

multiple pk

[1]

$$\begin{tikzcd}
 & \mathscr{C}_0 \arrow[dl] \arrow[d] \arrow[dr] & \\
\mathscr{C}_1 \cdots & \mathscr{C}_i & \cdots \mathscr{C}_s
\end{tikzcd}$$

provide s public keys, $b \in \{0, \ldots, s\}$
response is isometry $\mathscr{C}_b \to \tilde{\mathscr{C}}$

2

fix weight

[2]

- generate $\mathscr{C}_0 \to \tilde{\mathscr{C}}$ from seed
- respond to $b = 0$ with seed
- response much cheaper!

▼

adjust probability so that
$b = 0$ appears more

[1] L. De Feo and S. D. Galbraith. SeaSign: Compact isogeny signatures from class group actions. EUROCRYPT 2019.
[2] W. Beullens, S, Katsumata, and F. Pintore. Calamari and Falafl: Logarithmic (linkable) ring signatures from isogenies and lattices. ASIACRYPT 2020.
[3] J. Ding, M-S Chen, A. Petzoldt, D. Schmidt, B-Y. Yang, M. Kannwischer, and J. Patarin. Rainbow. NIST 2020.
[4] W. Beullens, M-S. Chen, S-H. Hung, M. Kannwischer, B. Peng, C-J. Shih, and B-Y. Yang. Oil and Vinegar: Modern parameters and implementations.

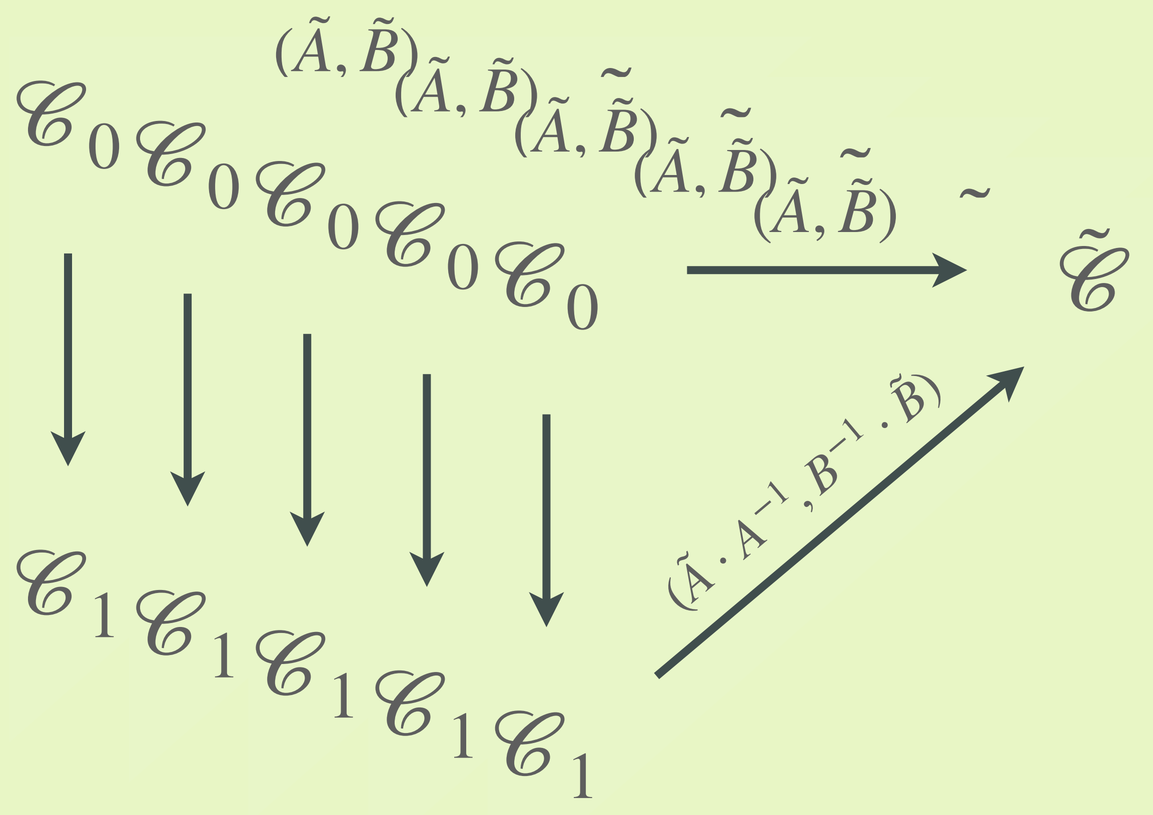
footnote

From MCE to MEDS

naive approach

$$\begin{tikzcd}
\mathscr{C}_0 \arrow[r, "(\tilde{A},\tilde{B})"] \arrow[d, "(A,B)"'] & \tilde{\mathscr{C}} \\
\mathscr{C}_1 \arrow[ur, "(\tilde{A}\cdot A^{-1}, B^{-1}\cdot \tilde{B})"'] &
\end{tikzcd}$$

repeat t times



1 multiple pk [1]

$$\begin{tikzcd}
 & & \mathscr{C}_0 \arrow[dll] \arrow[d] \arrow[drr] & & \\
\mathscr{C}_1 & \cdots & \mathscr{C}_i & \cdots & \mathscr{C}_s
\end{tikzcd}$$

provide s public keys, $b \in \{0,\ldots,s\}$
response is isometry $\mathscr{C}_b \to \tilde{\mathscr{C}}$

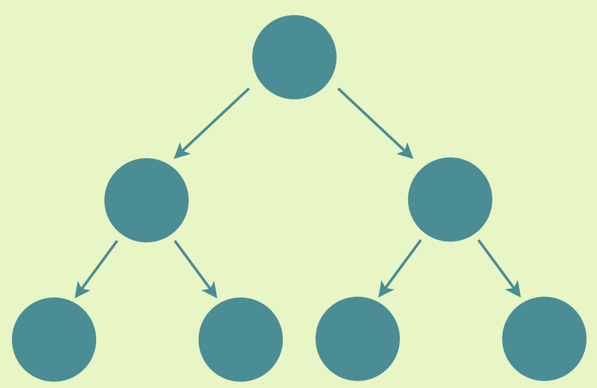
2 fix weight [2]

- generate $\mathscr{C}_0 \to \tilde{\mathscr{C}}$ from seed
- respond to $b = 0$ with seed
- response much cheaper!

adjust probability so that
$b = 0$ appears more

3 seed tree [2]

instead of sending t seeds, send tree



to reveal nodes $N_1,\ldots,N_w$, communicate $N_1\ldots,N_w$ and for the $t-w$ remaining nodes only appropriate parent nodes

[1] L. De Feo and S. D. Galbraith. SeaSign: Compact isogeny signatures from class group actions. EUROCRYPT 2019.

[2] W. Beullens, S, Katsumata, and F. Pintore. Calamari and Falafl: Logarithmic (linkable) ring signatures from isogenies and lattices. ASIACRYPT 2020.

[3] J. Ding, M-S Chen, A. Petzoldt, D. Schmidt, B-Y. Yang, M. Kannwischer, and J. Patarin. Rainbow. NIST 2020.

[4] W. Beullens, M-S. Chen, S-H. Hung, M. Kannwischer, B. Peng, C-J. Shih, and B-Y. Yang. Oil and Vinegar: Modern parameters and implementations.