From MCE to MEDS

1 equivalence relation → 2 zero knowledge identification scheme → 3 signature scheme!

Fiat-Shamir

1 → 2

SETUP

- Assume parameter set $q, n, m, k.$ and "starting" code $\mathscr{C}_0$
- Generate **secret key** $A \in \mathrm{GL}_m(q)$, $B \in \mathrm{GL}_n(q)$
- Generate **public key** $\mathscr{C}_1 = A\mathscr{C}_0 B$

COMMIT

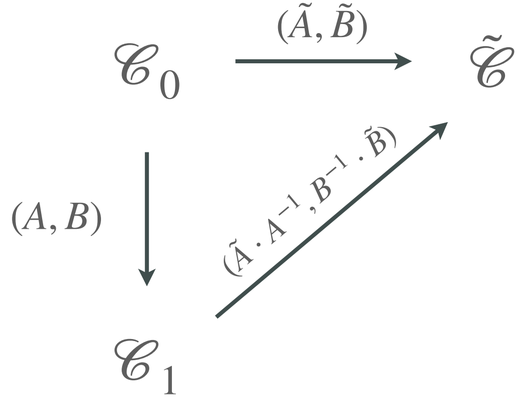
- Generate **ephemeral** $\tilde{A} \in \mathrm{GL}_m(q)$, $\tilde{B} \in \mathrm{GL}_n(q)$
- Generate **ephemeral code** $\tilde{\mathscr{C}} = \tilde{A}\mathscr{C}_0\tilde{B}$

CHALLENGE

- Pick a bit $b \in \{0,1\}$

RESPONSE

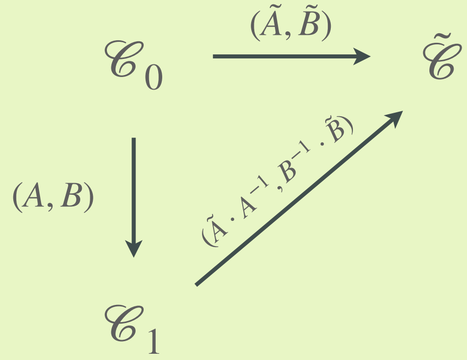
- if $b = 0$, reply with $(\tilde{A}, \tilde{B})$
- if $b = 1$, reply with $(\tilde{A} \cdot A^{-1}, B^{-1} \cdot \tilde{B})$



soundness 1/2

From MCE to MEDS

naive approach



repeat t times