KBCV 2.0 – Automatic Completion Experiments

IWC 2013

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Outline

- Basic facts
- Features
- Completion Refresher
- Optimization
- Experiments

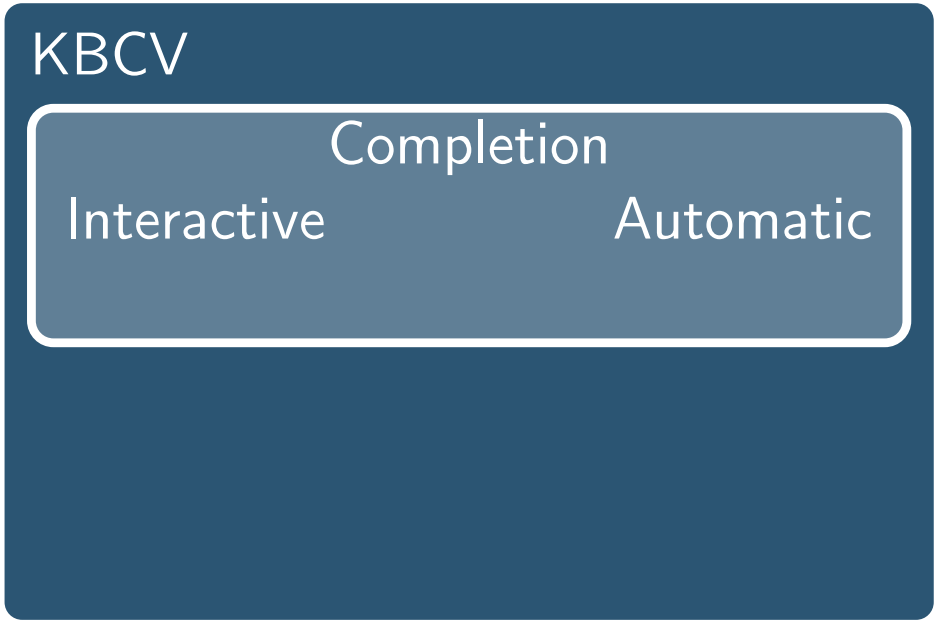
Basic facts

- `http://cl-informatik.uibk.ac.at/software/kbcv/`
- Programmed in Scala
- CLI & GUI & hybrid & web-interface
- Based on Bachmair and Dershowitz' inference system
  - External termination checker: $\mathsf{T}_\mathsf{T}\mathsf{T}_2$
  - Derivation history
- For students
  - Huet's algorithm
  - Freely apply inference rules
- Undo/Redo

Features

KBCV

Features



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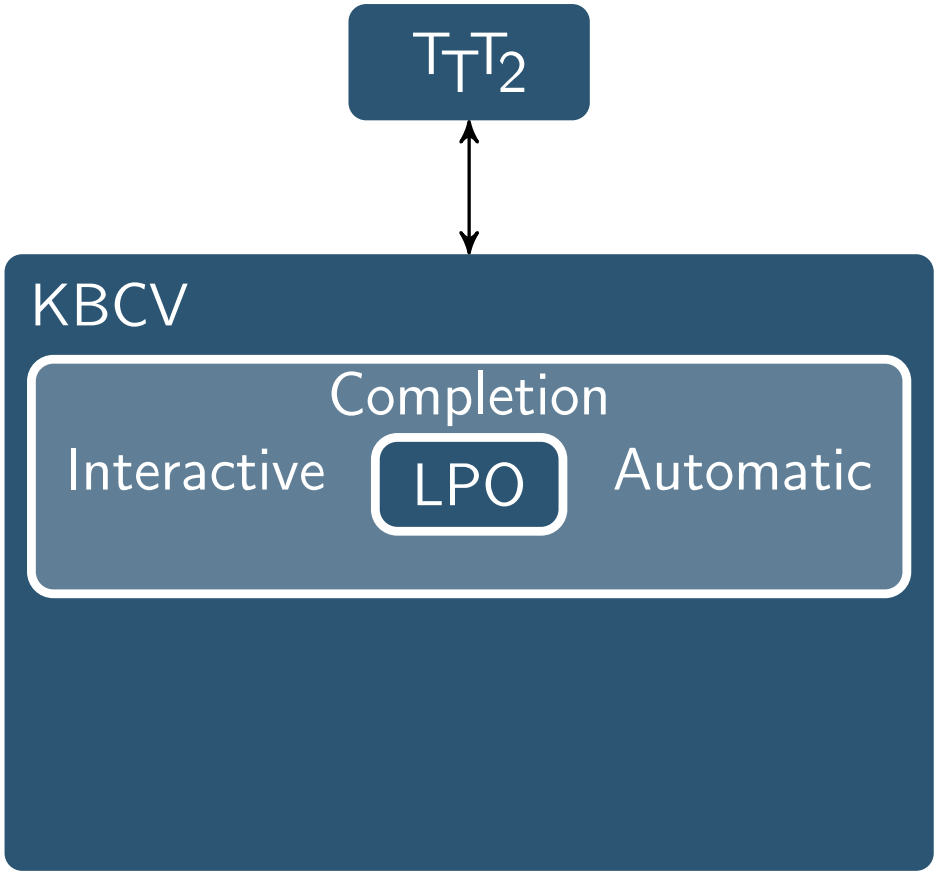

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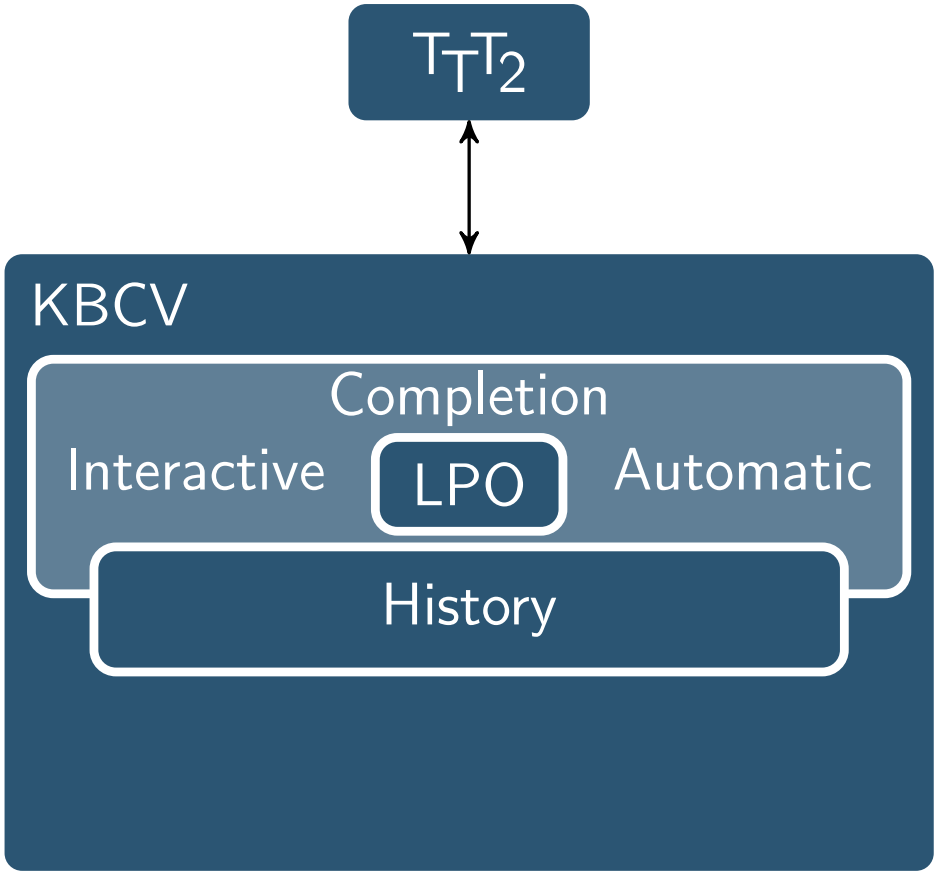

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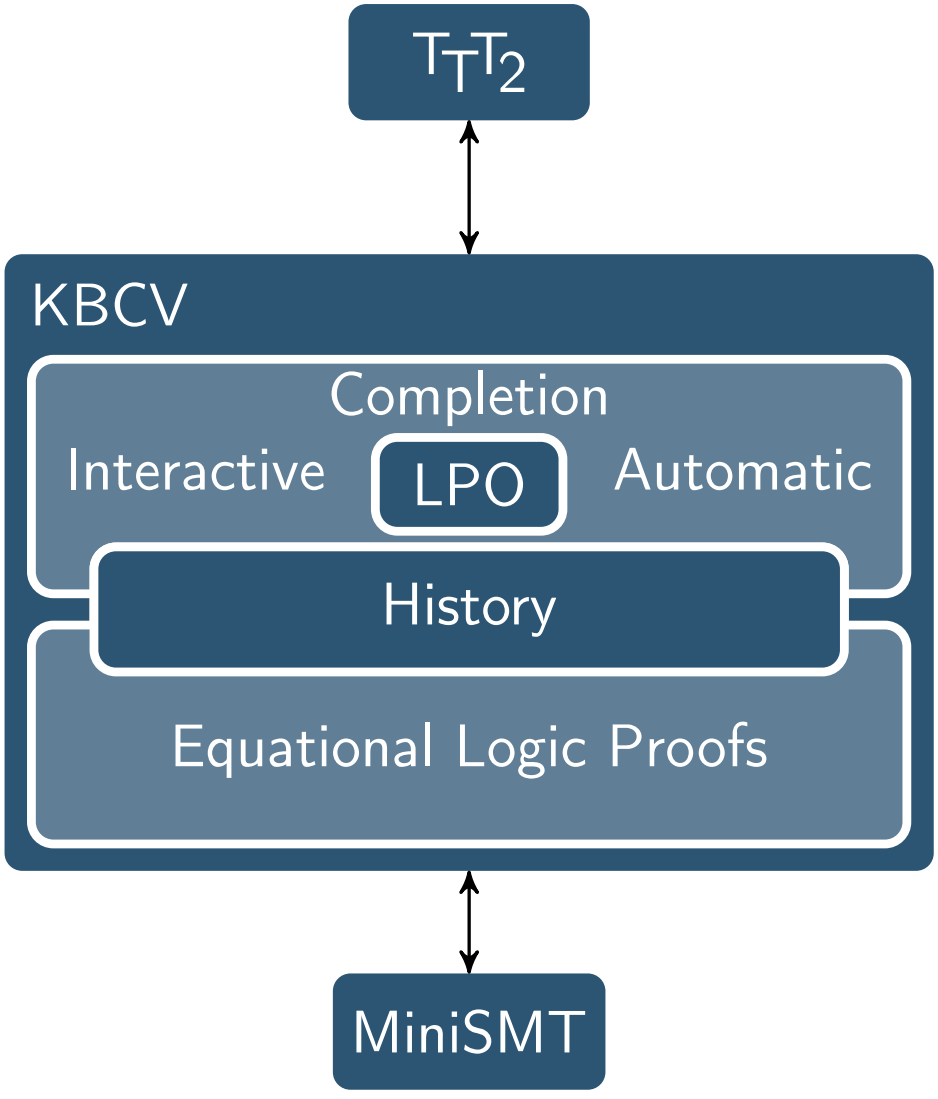
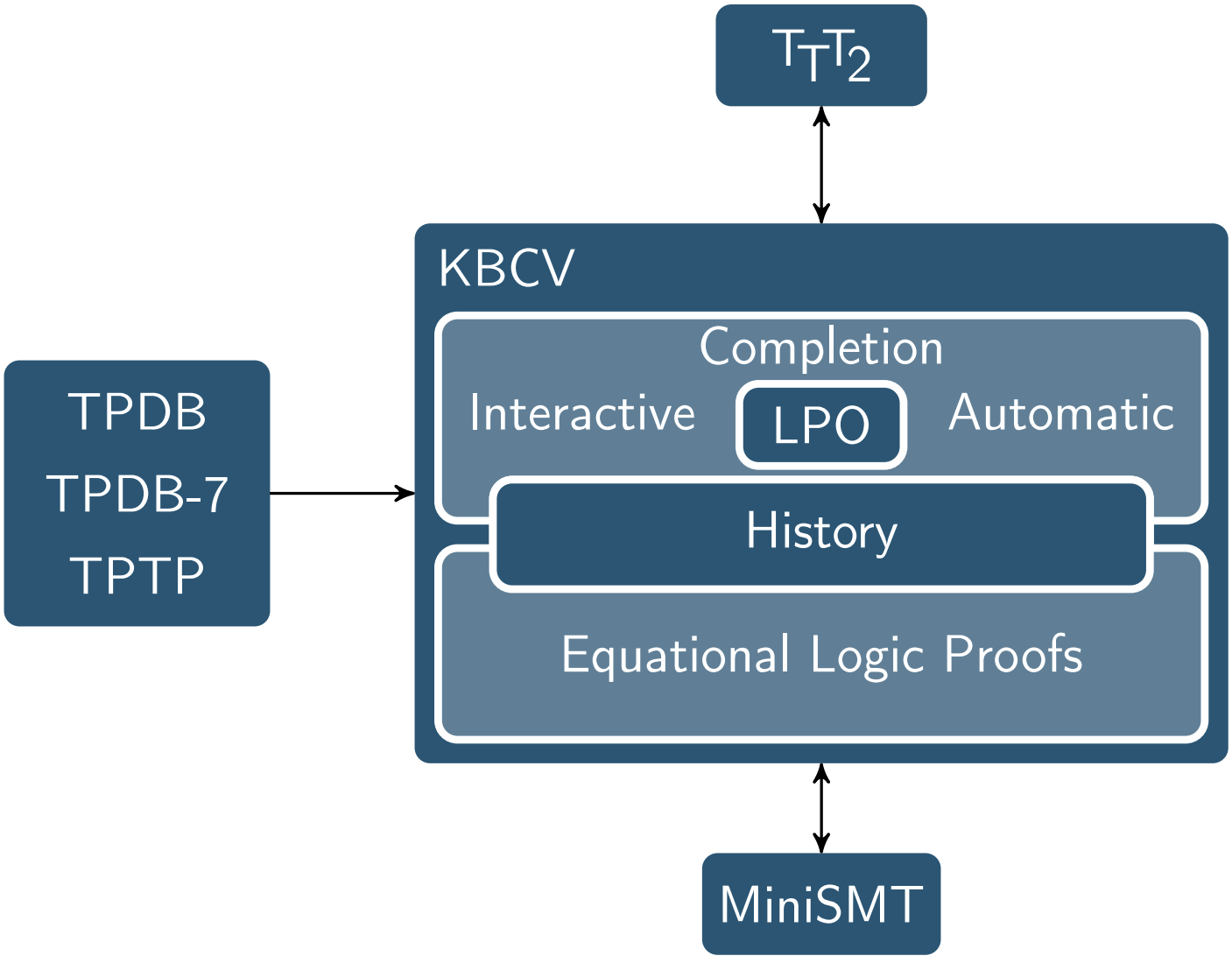

TTT2
KBCV
Completion
Interactive
LPO
Automatic
History
Equational Logic Proofs
MiniSMT

Features


TTT2
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TPDB-7
TPTP
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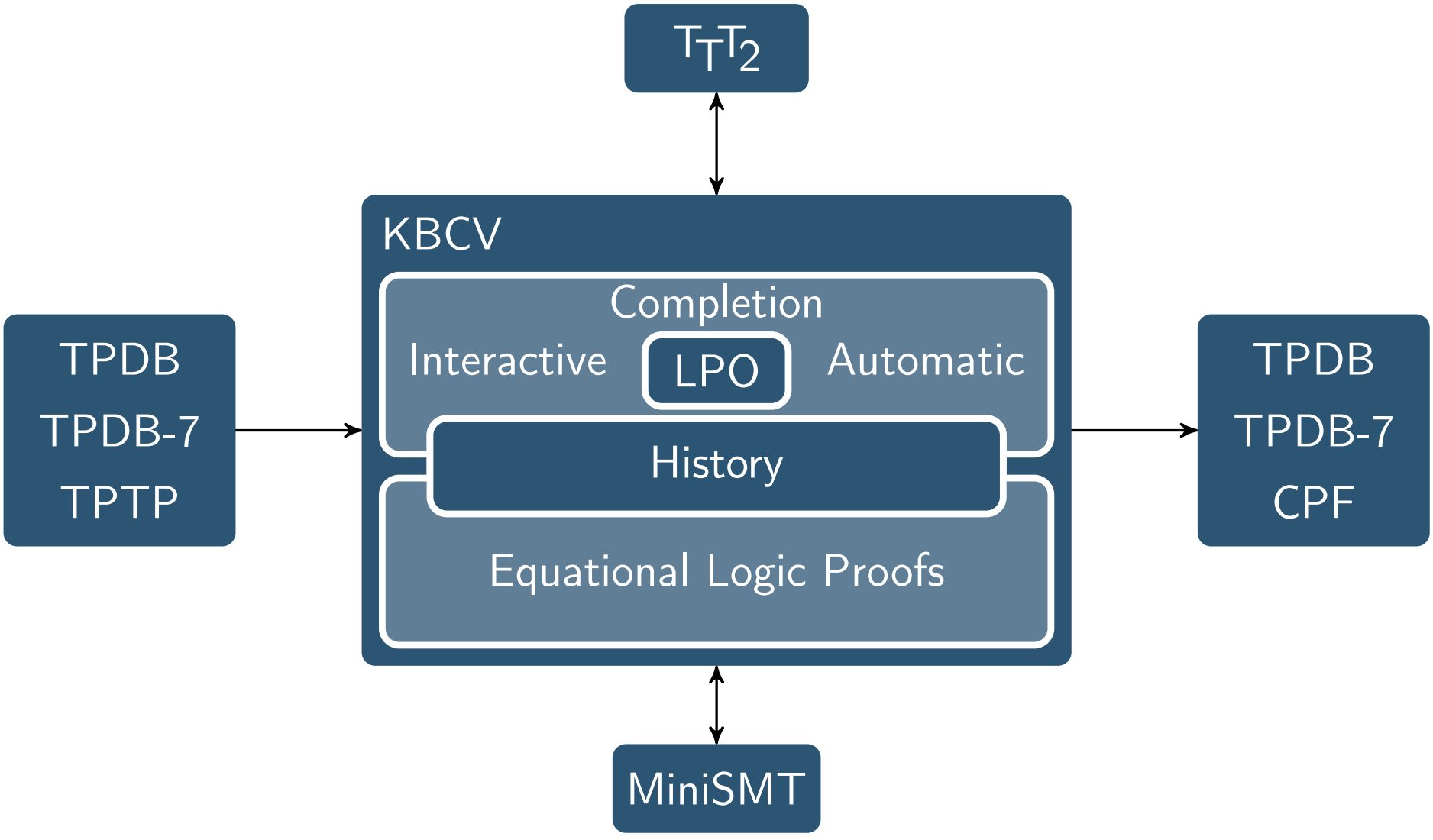
Features


TTT2
KBCV
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TPDB-7
TPTP
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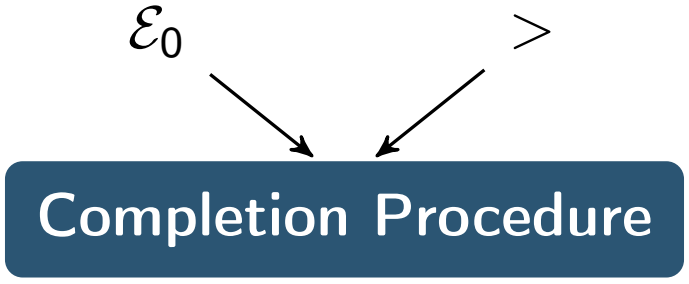
TPDB-7
CPF
MiniSMT

Completion Refresher



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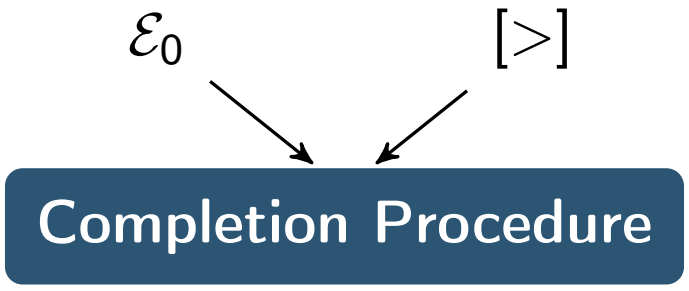
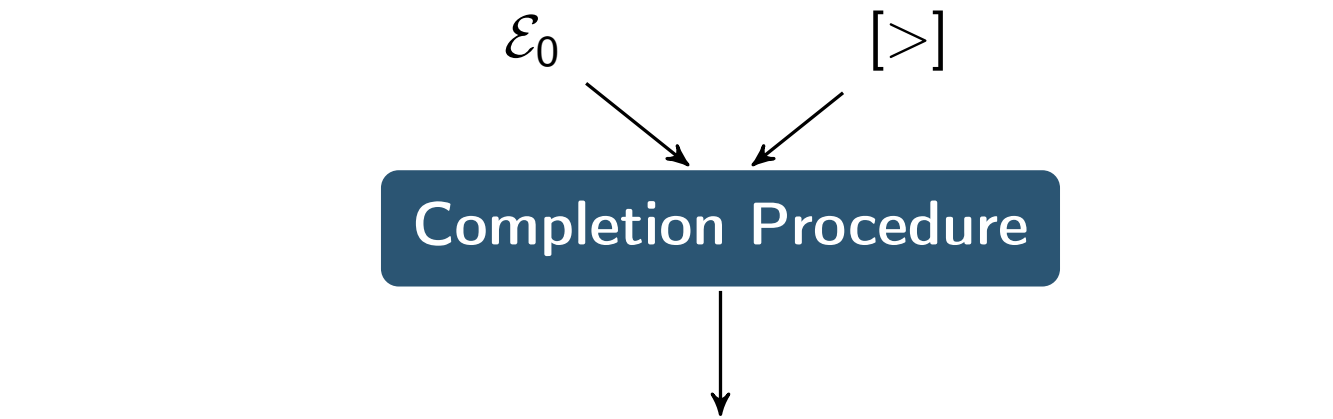
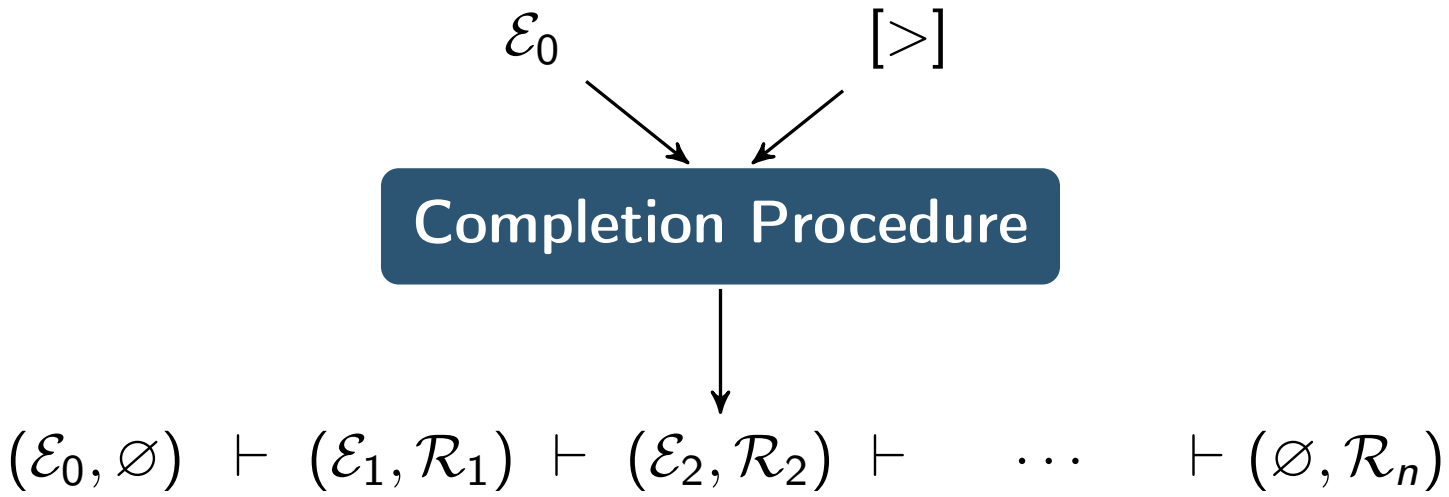



$\mathcal{E}_0$
$[>]$
Completion Procedure
$(\mathcal{E}_0, \varnothing) \vdash (\mathcal{E}_1, \mathcal{R}_1) \vdash (\mathcal{E}_2, \mathcal{R}_2) \vdash (\mathcal{E}_3, \mathcal{R}_3) \vdash \cdots$


$\mathcal{E}_0$
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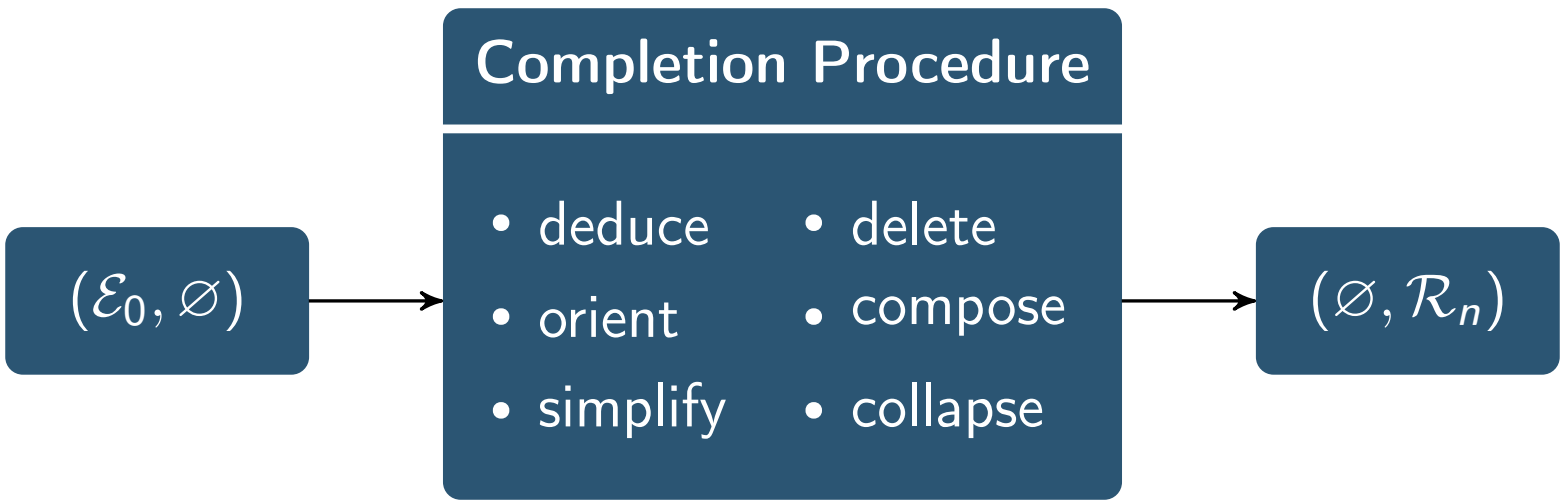
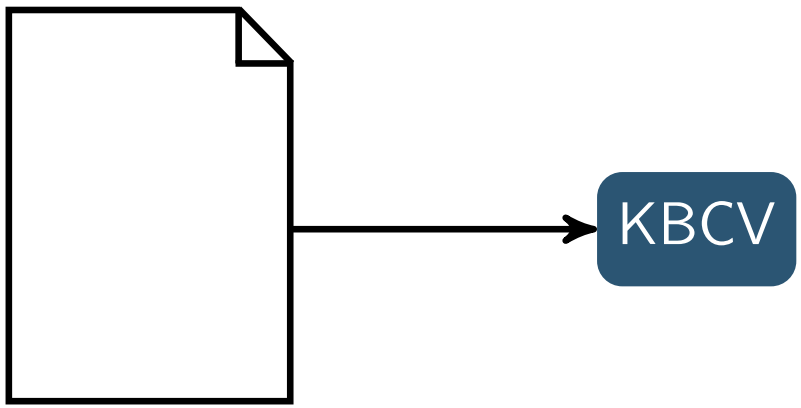
Completion Refresher



Motivation



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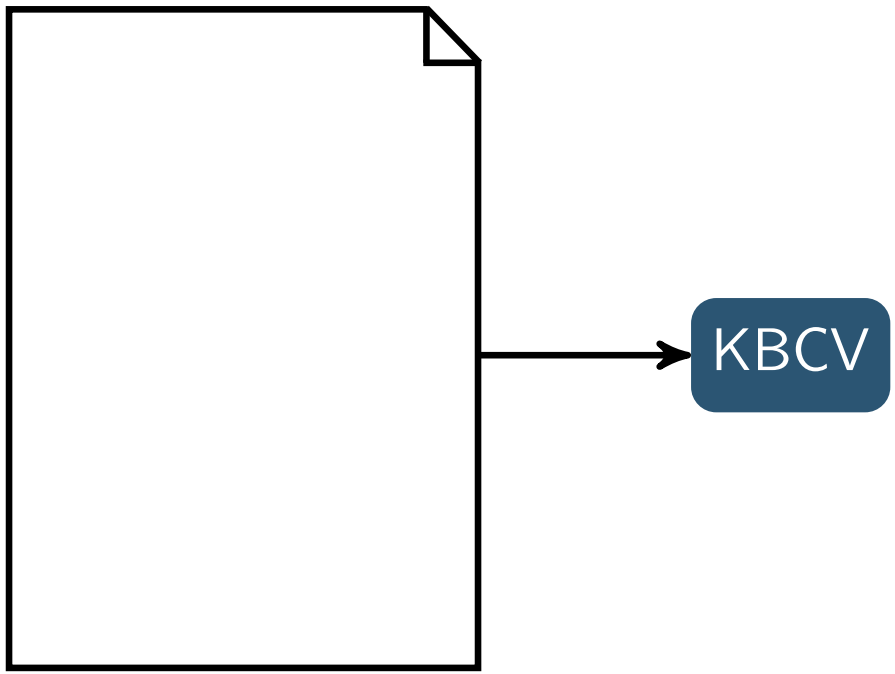

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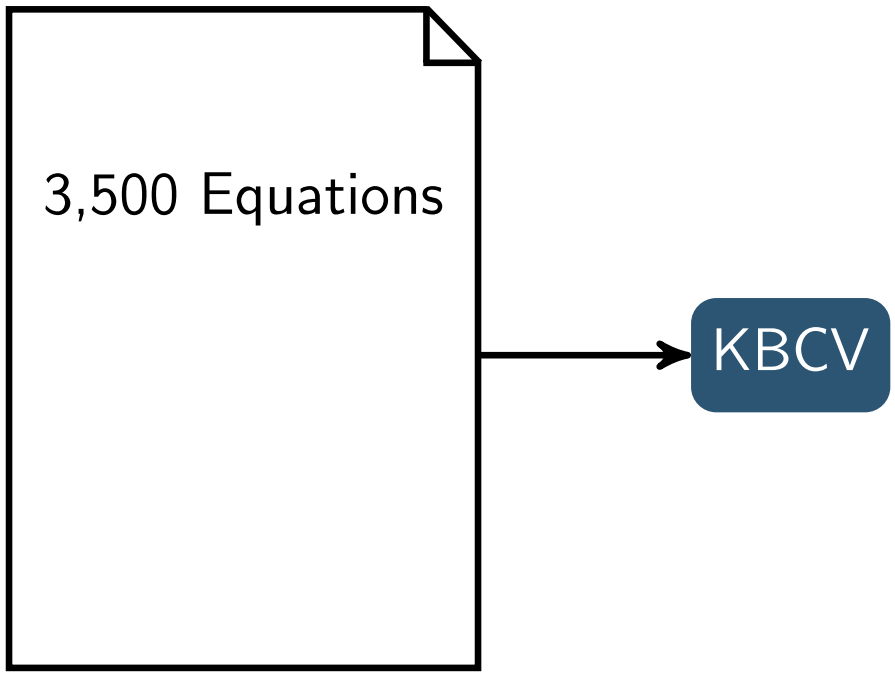

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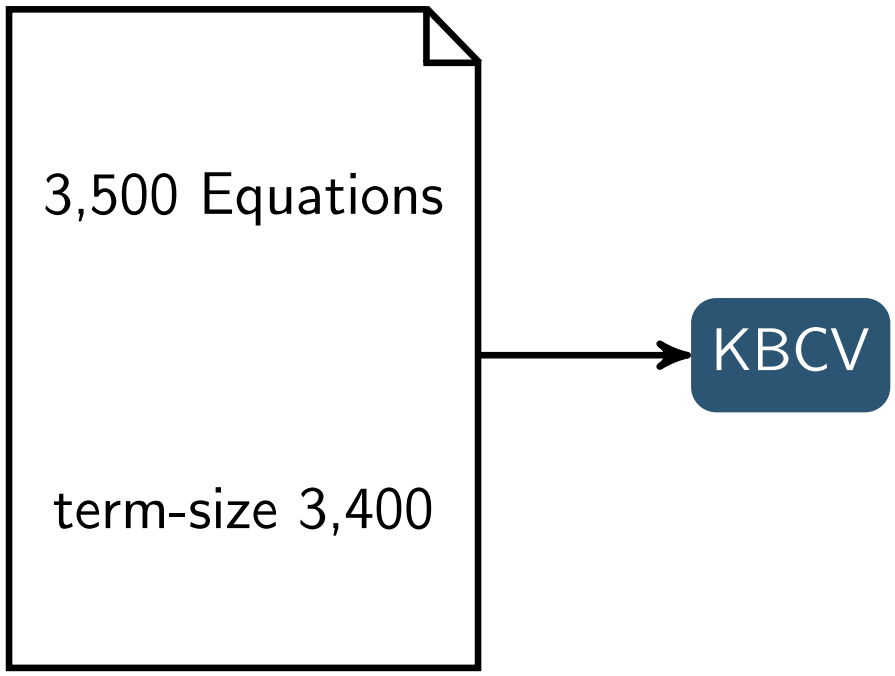

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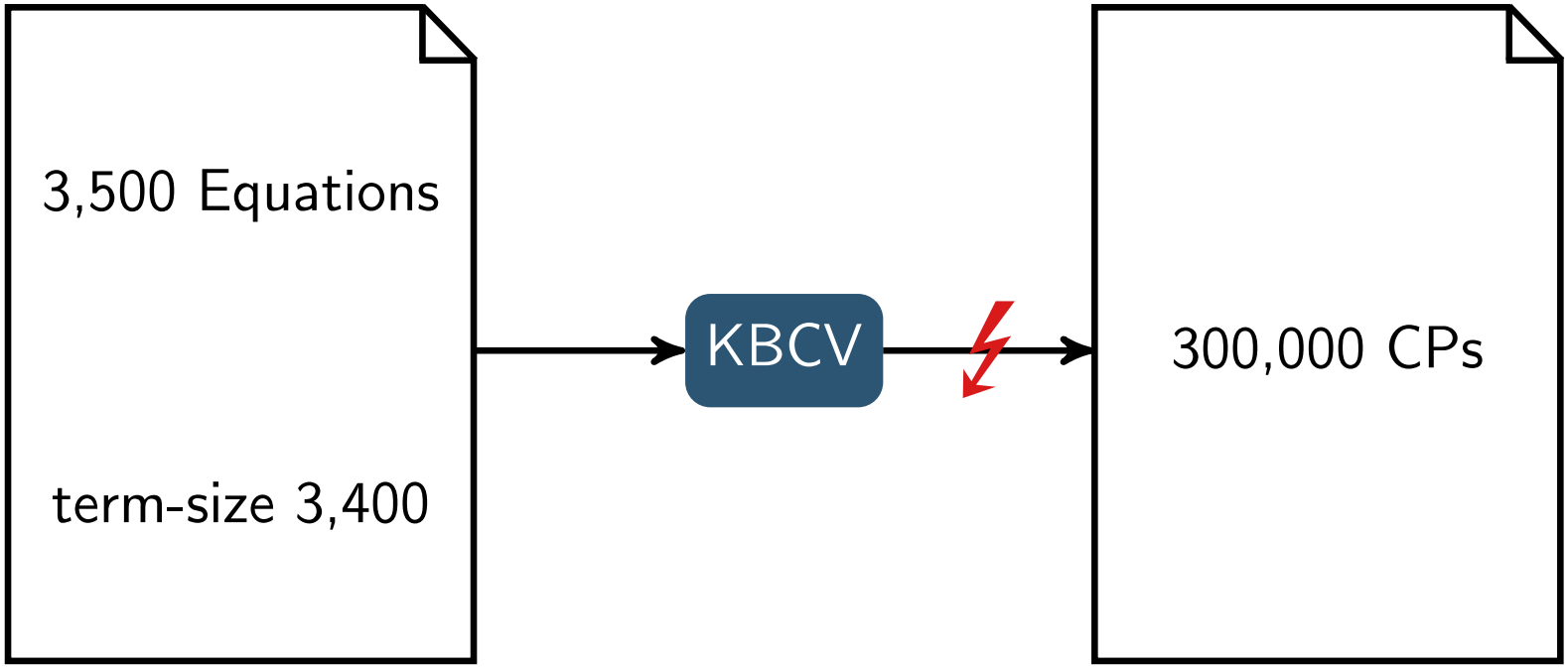

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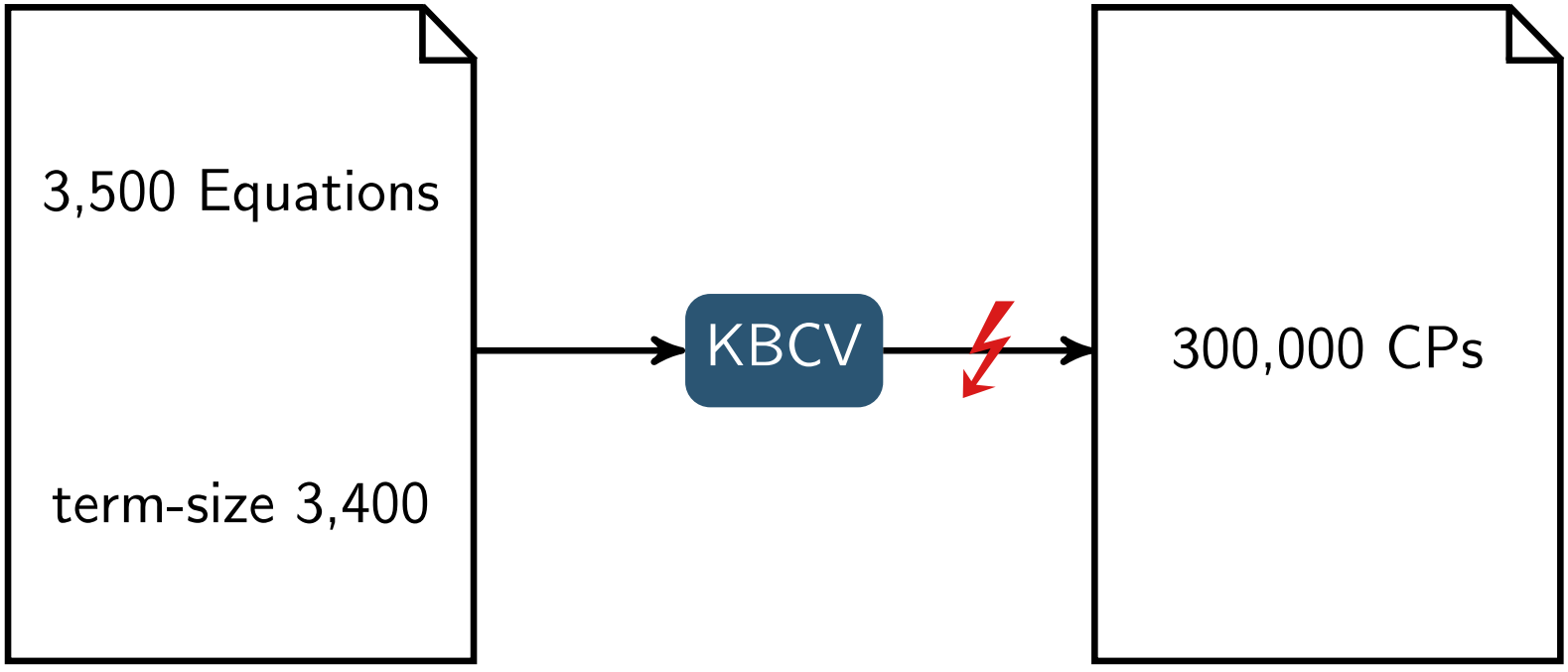
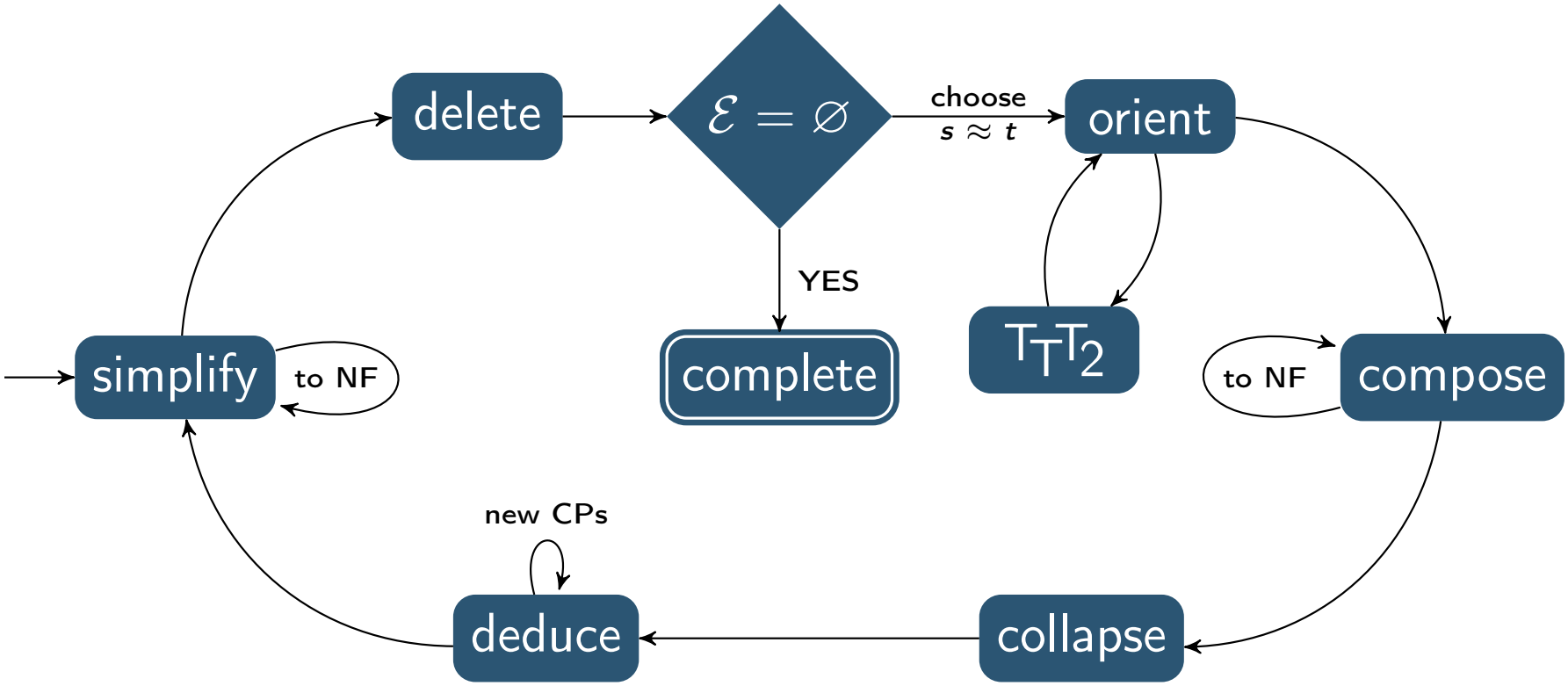


Initial Experiments on Deriving a Complete HOL Simplification Set
Cezary Kaliszyk and Thomas Sternagel
PxTP 2013, EPiC Series, 2013.

Optimization



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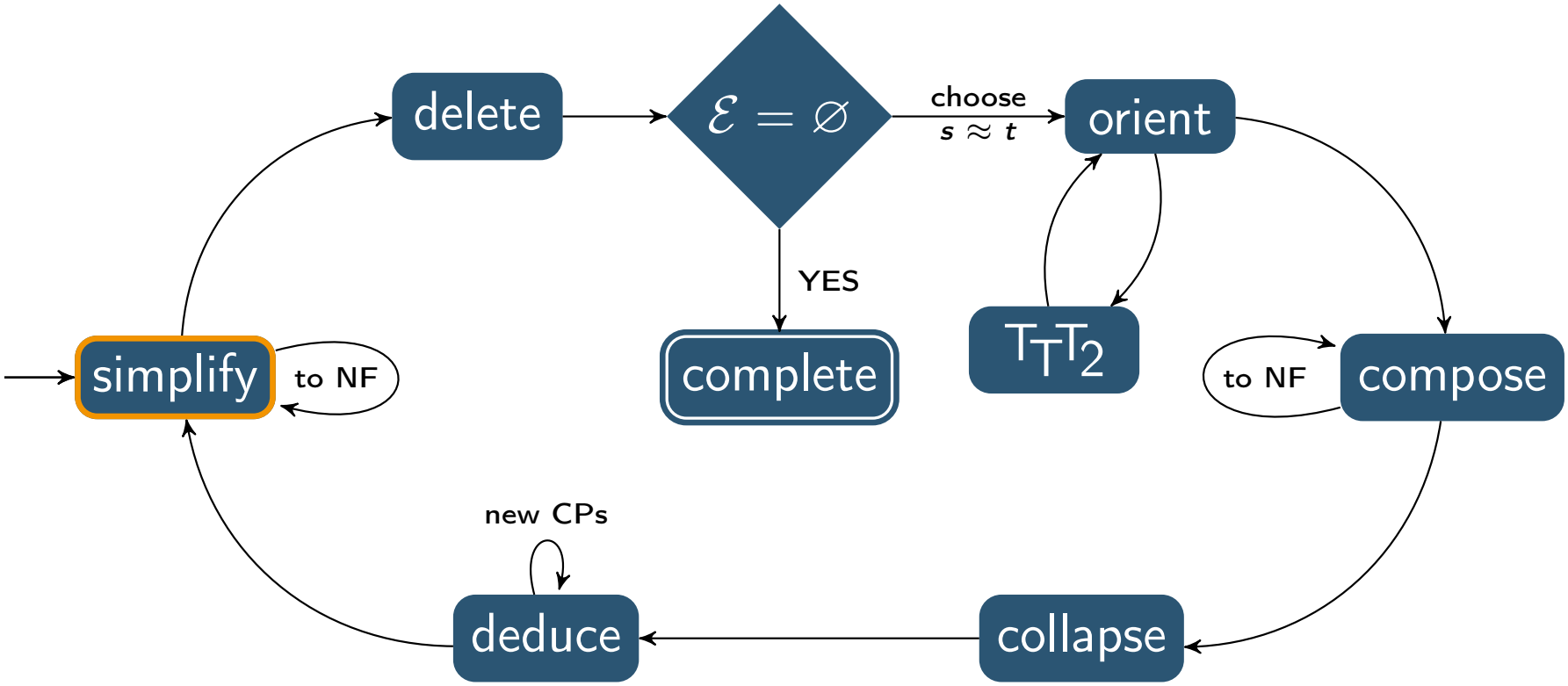

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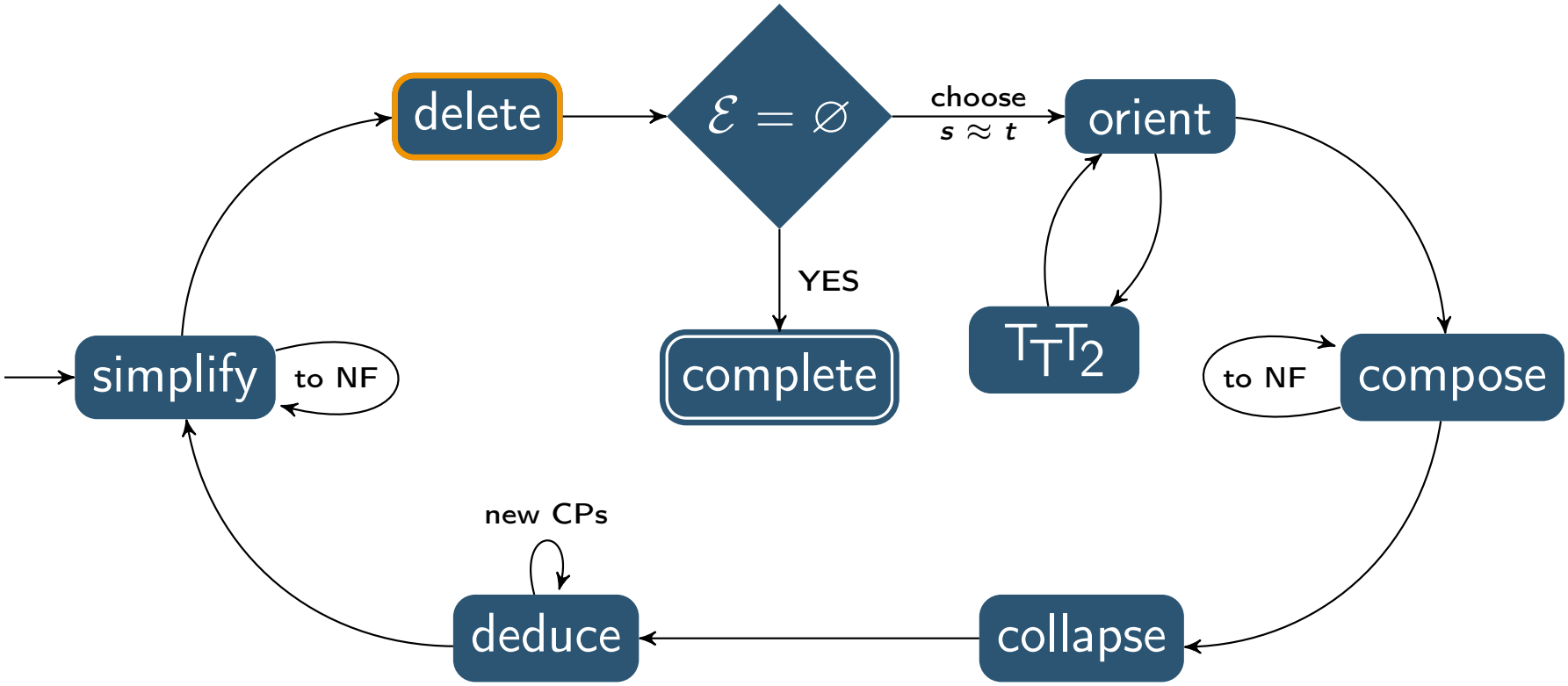

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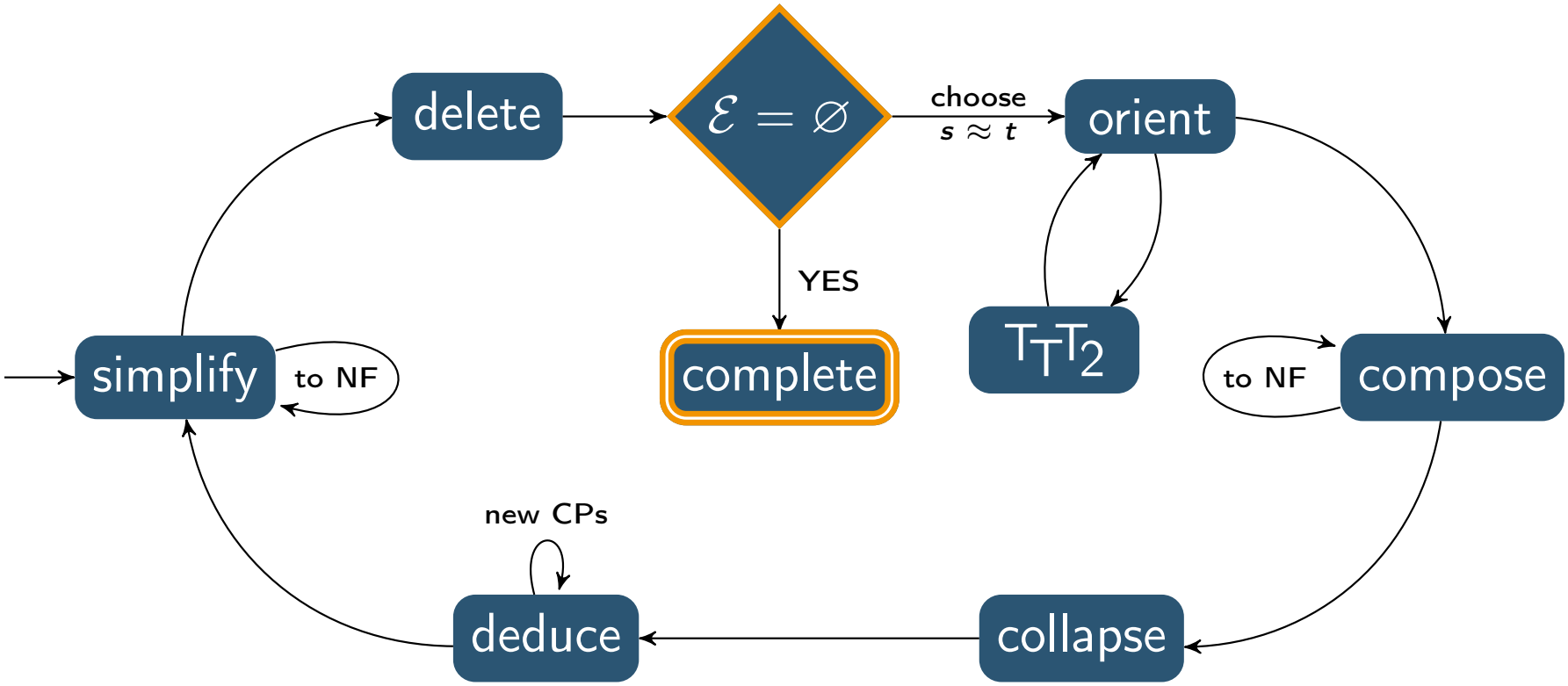

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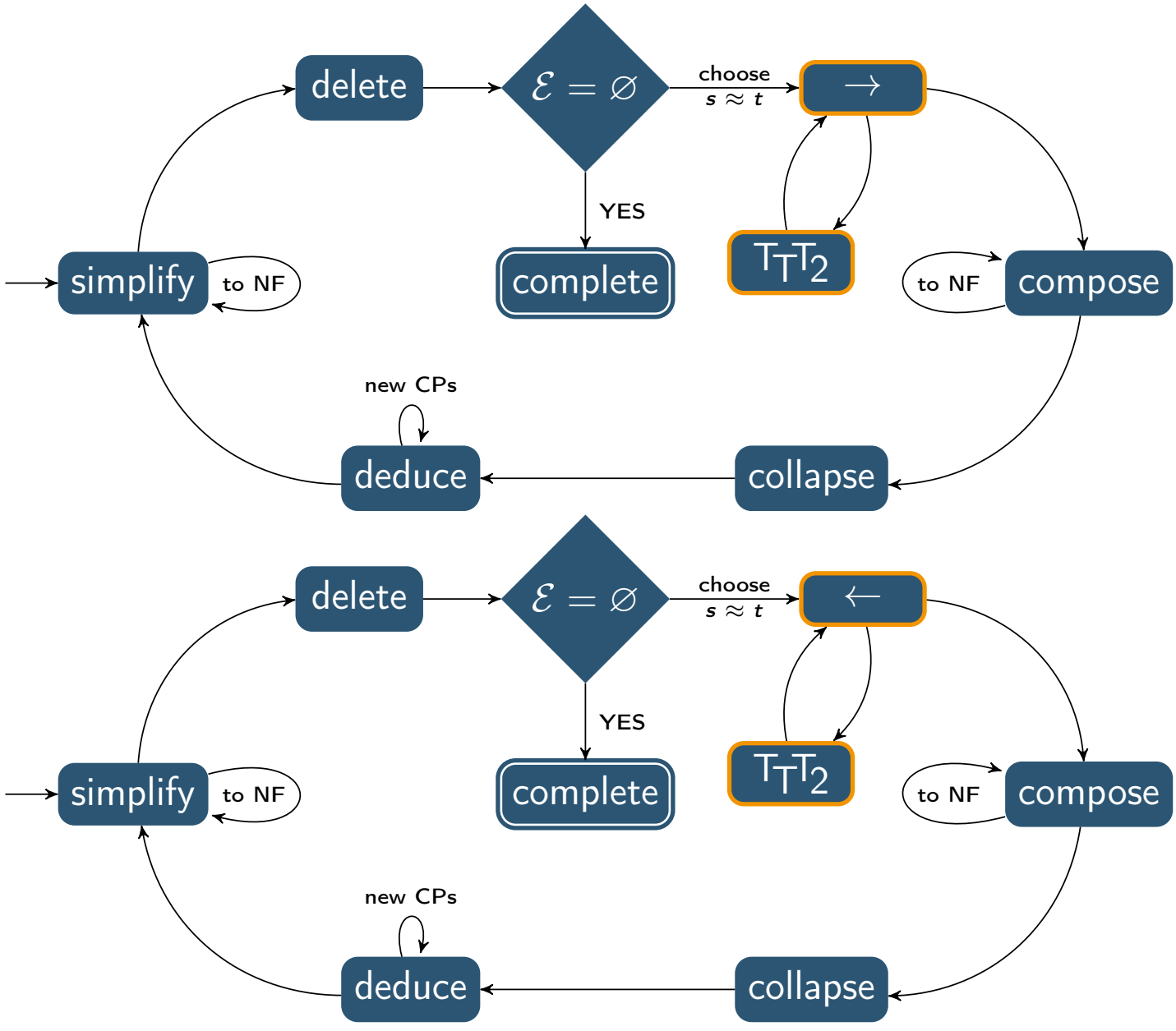

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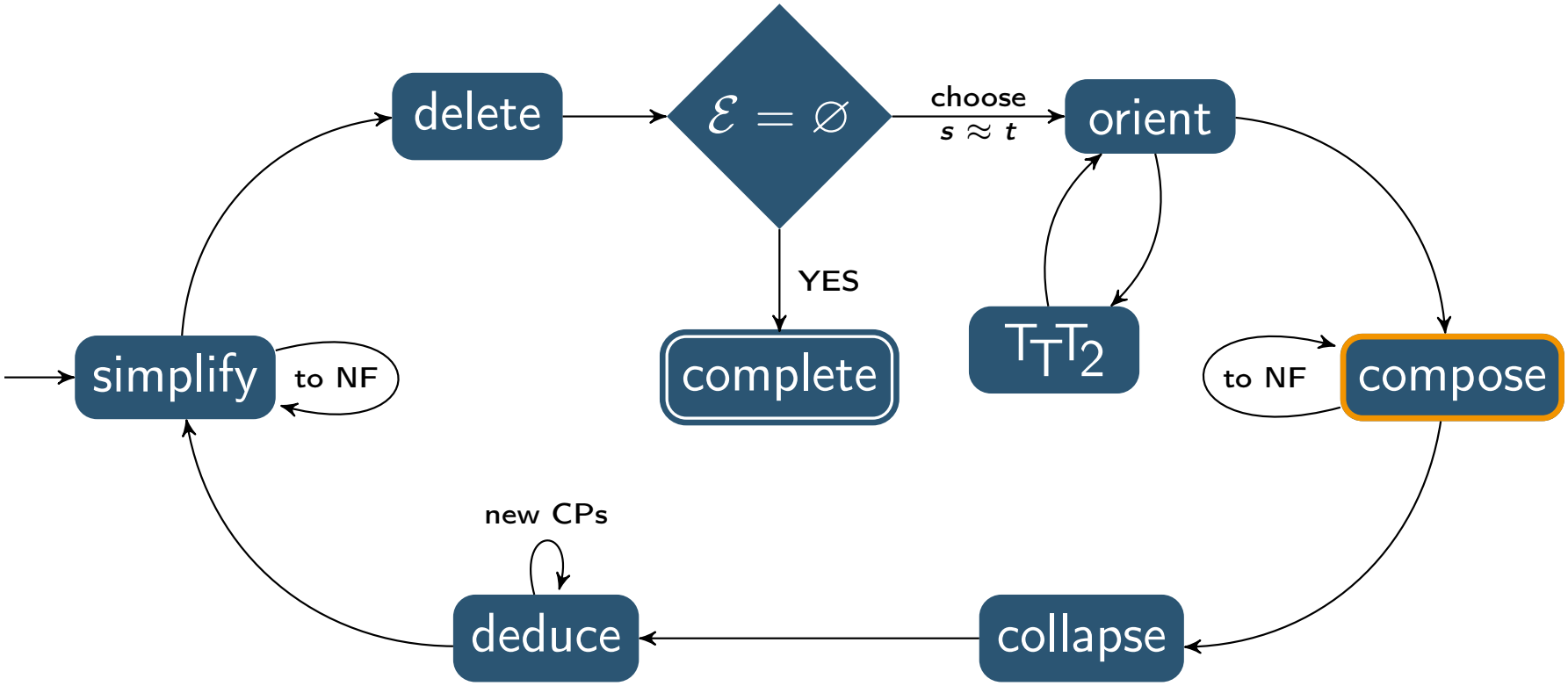

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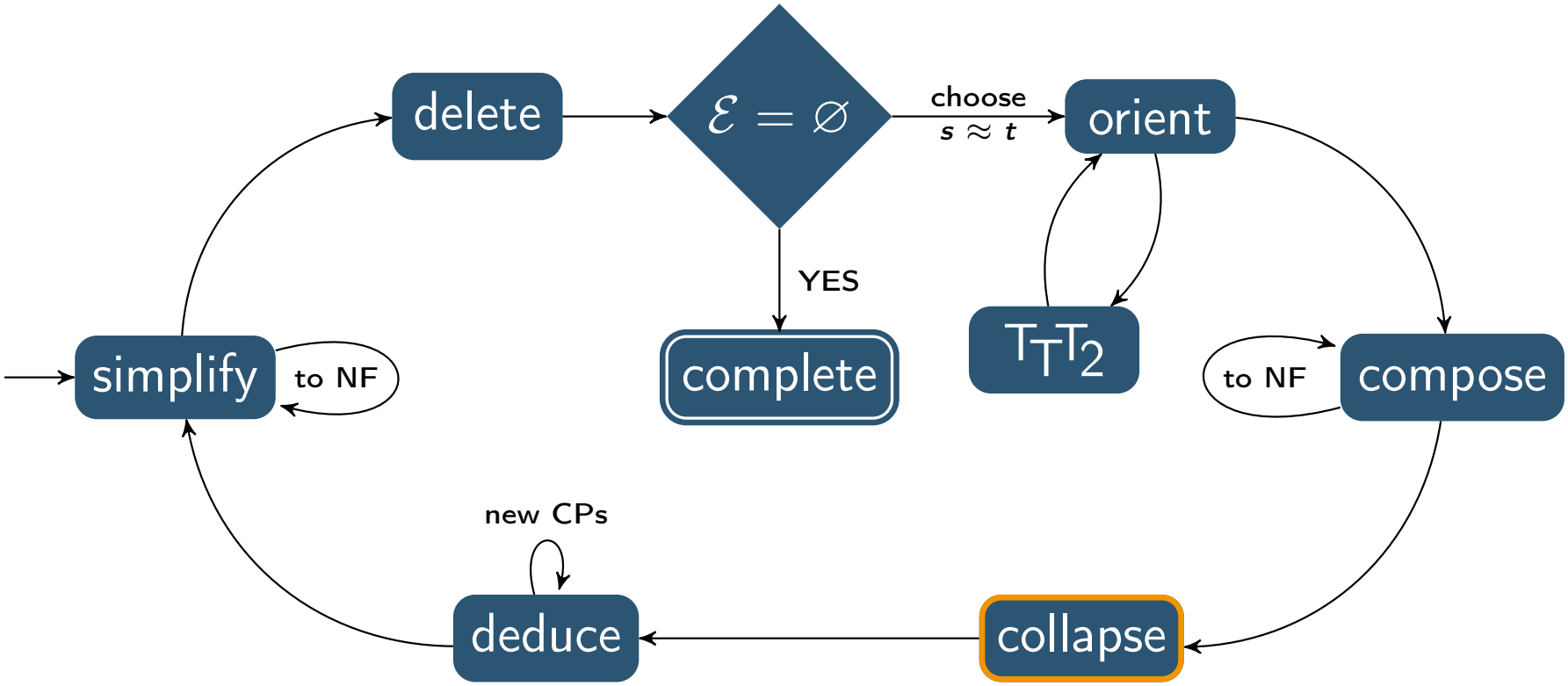

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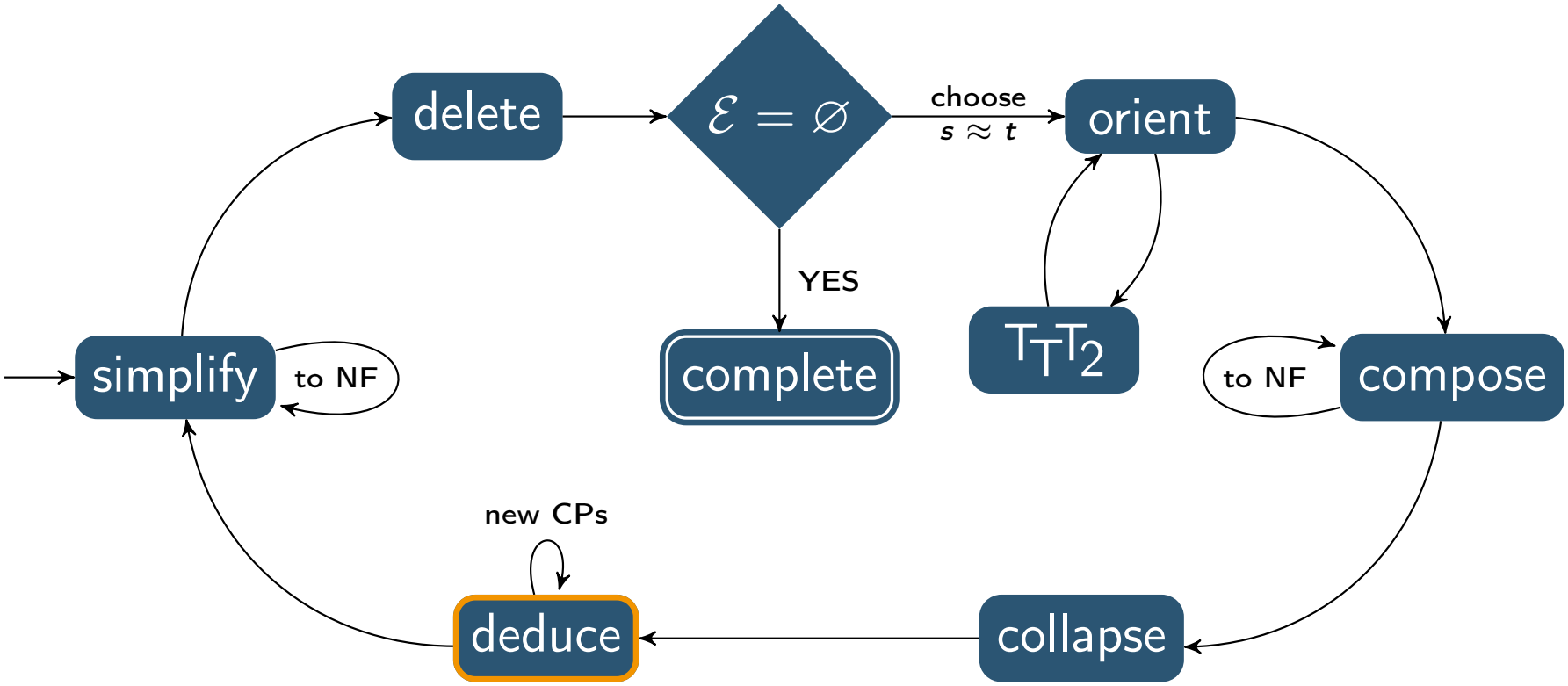

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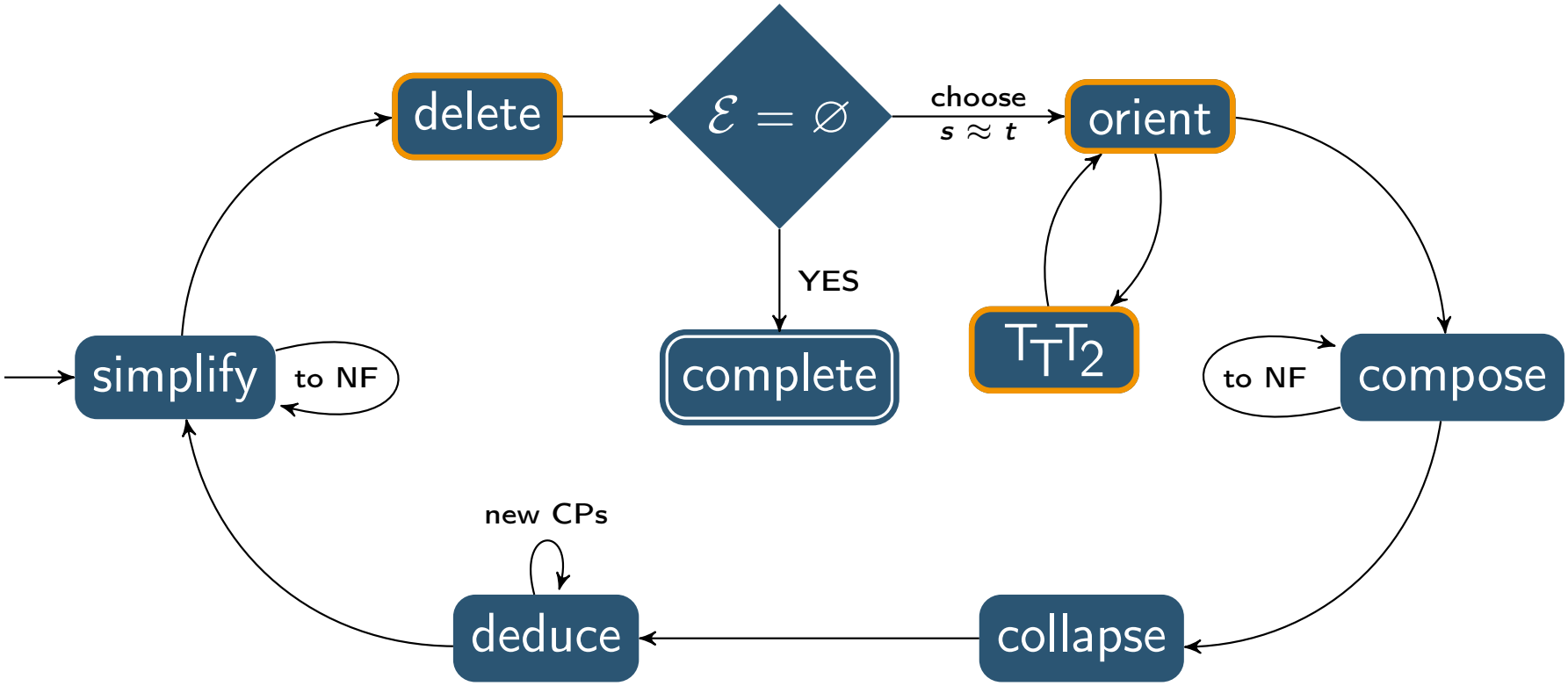

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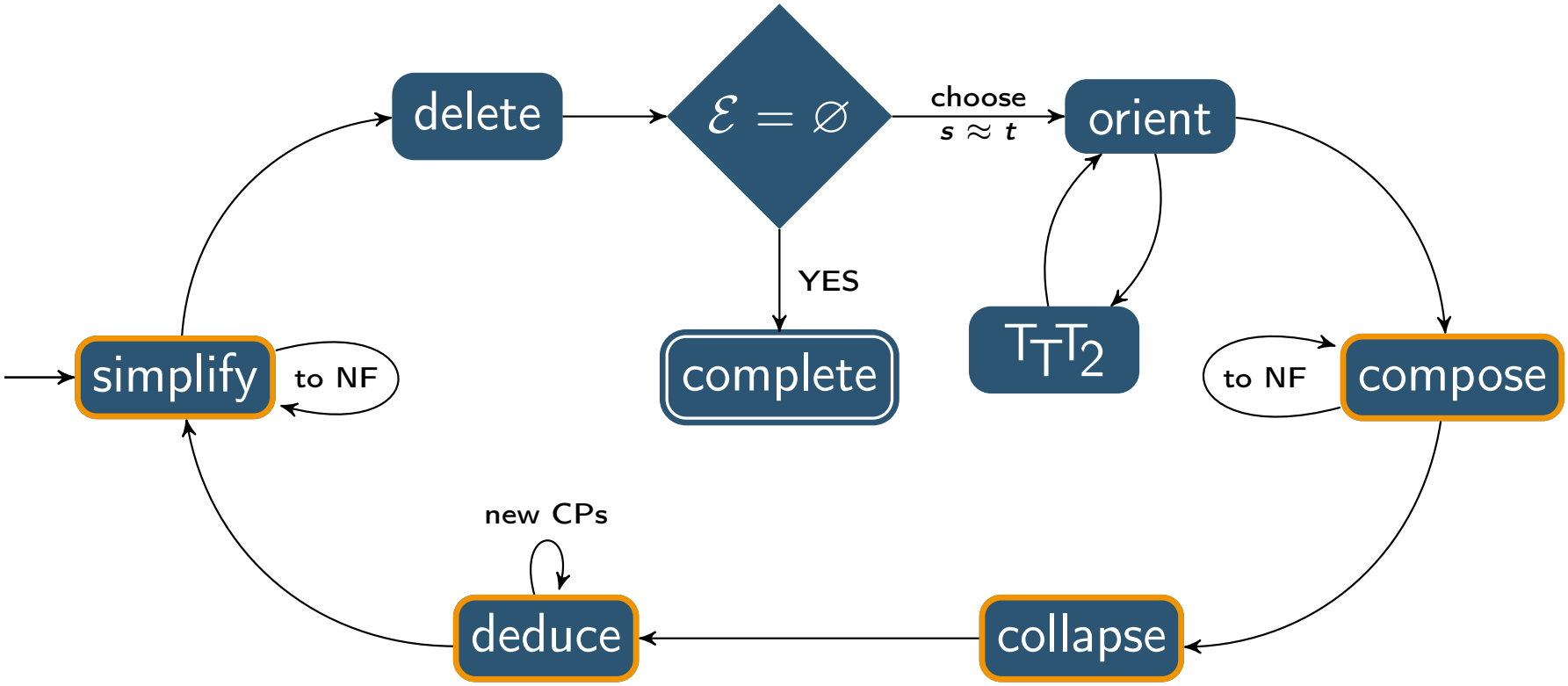

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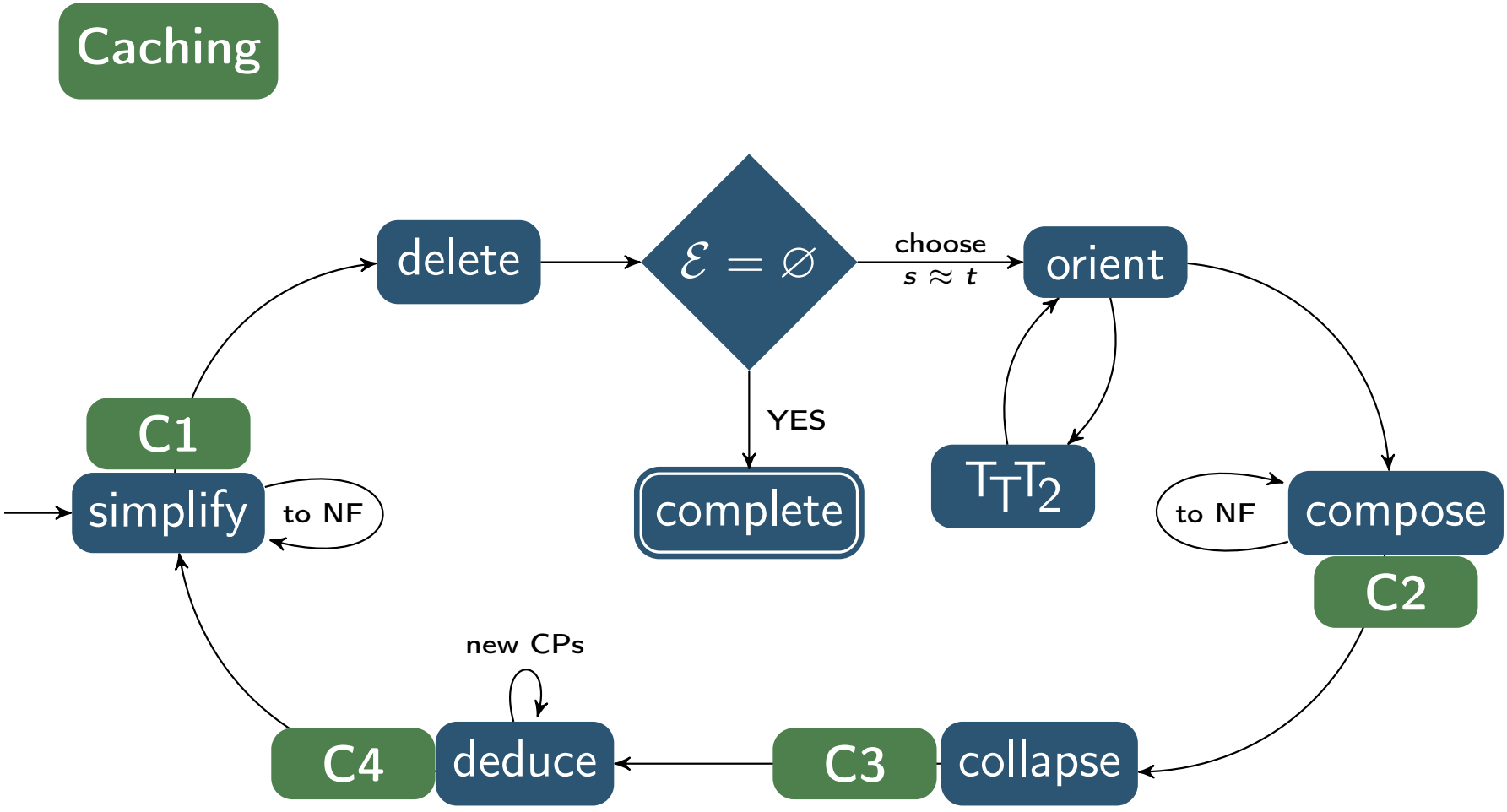

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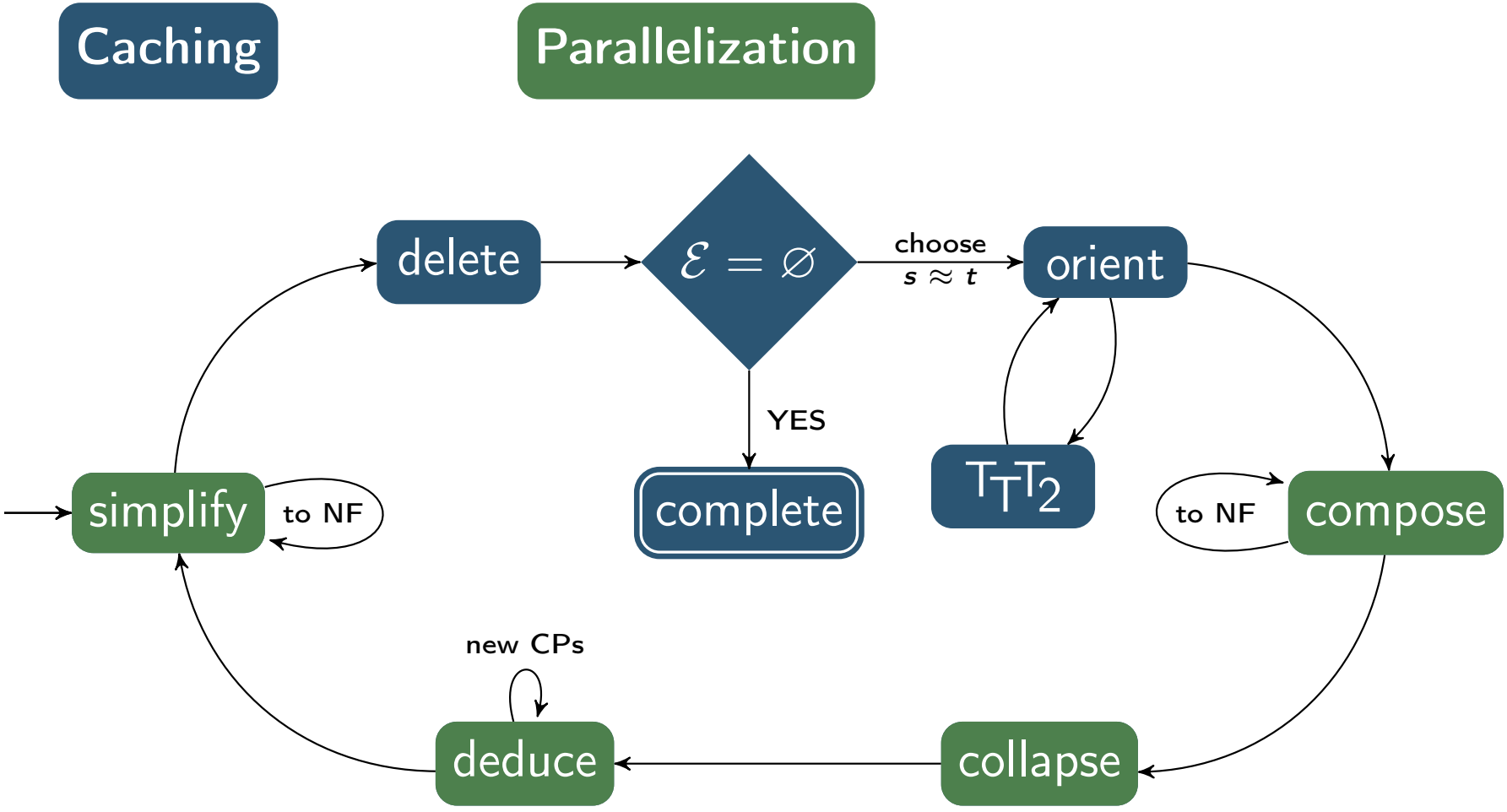

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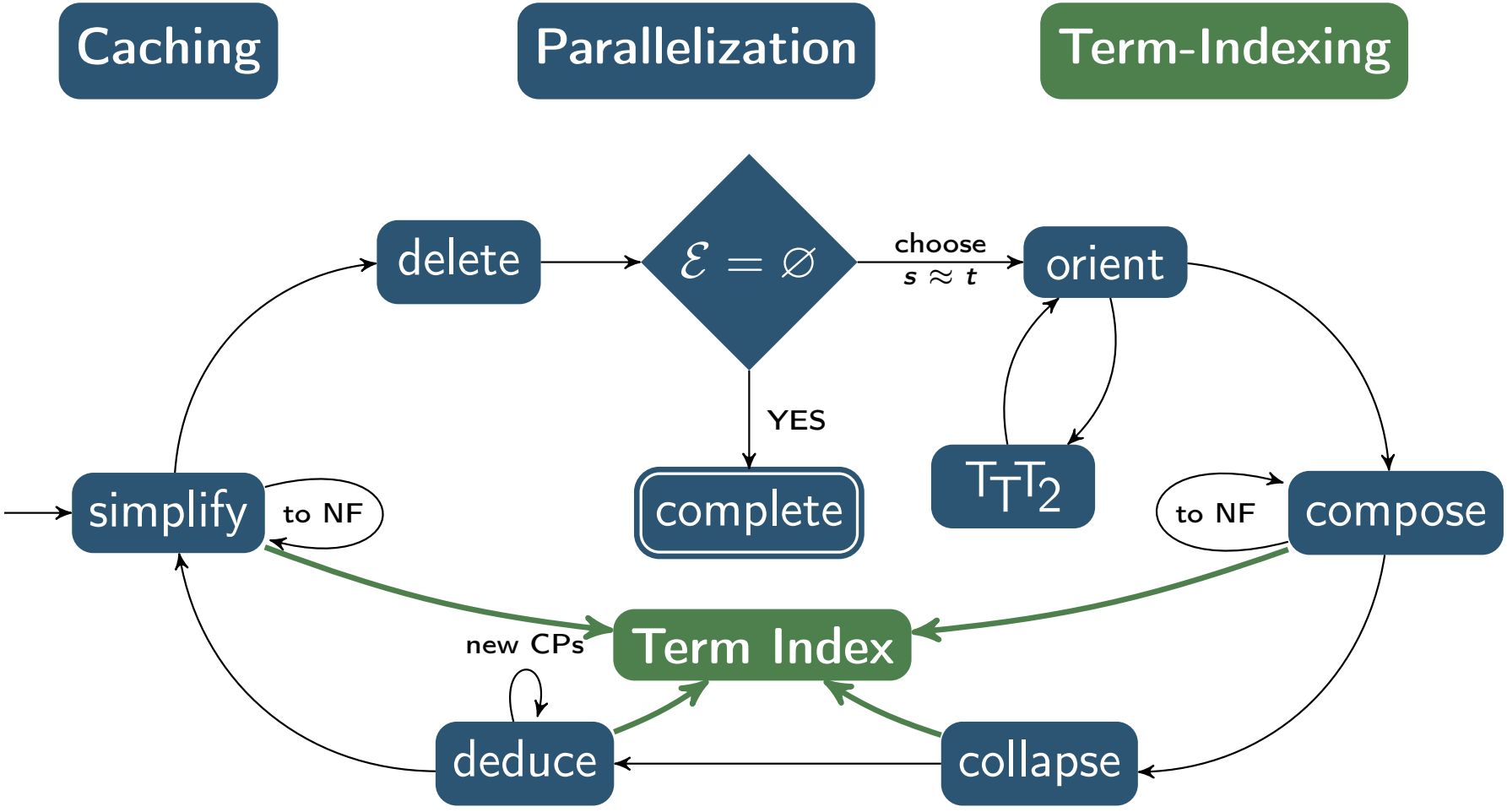

C	*P*	*T*	*completed*	*avg. time*	*speed-up*
			85	13.4	1.0
		×	85	5.9	2.3
	×		85	4.5	3.0
	×	×	85	3.8	3.5
×			87	5.9	2.9
×		×	89	13.1	3.5
×	×		90	14.7	4.0
×	×	×	90	12.4	4.5

Table : 48 processors, 115 systems, timeout 10 min.

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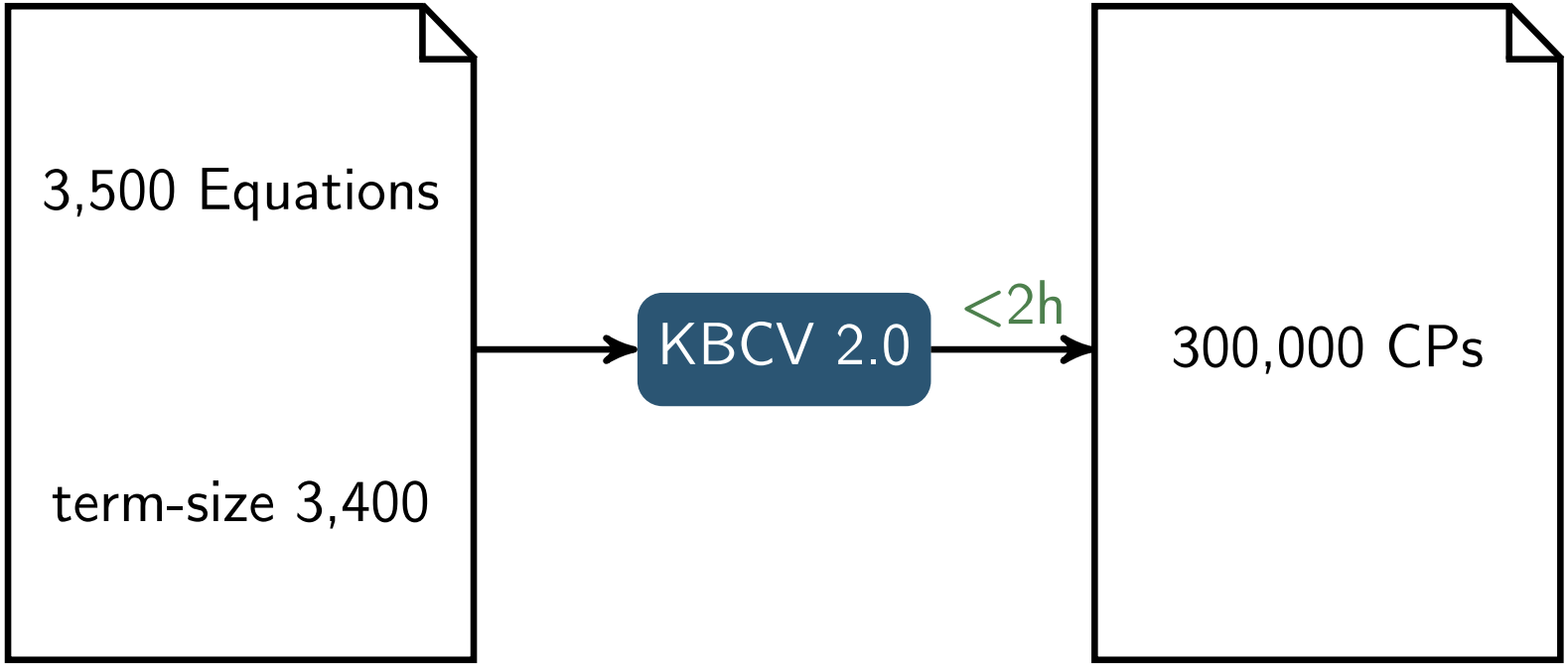
Experiments



Thank you for your attention!
Any questions?