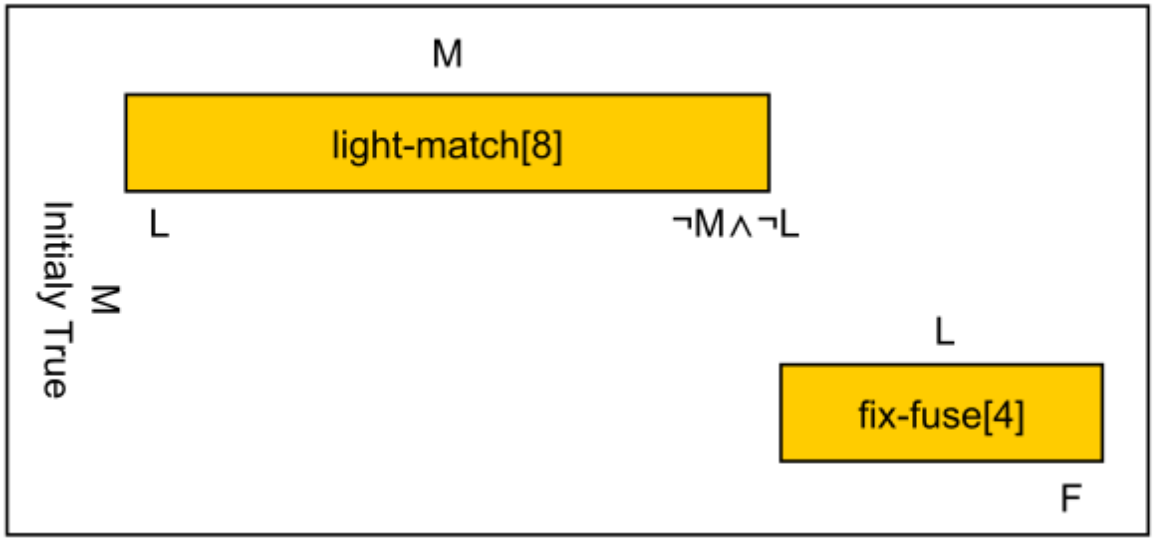
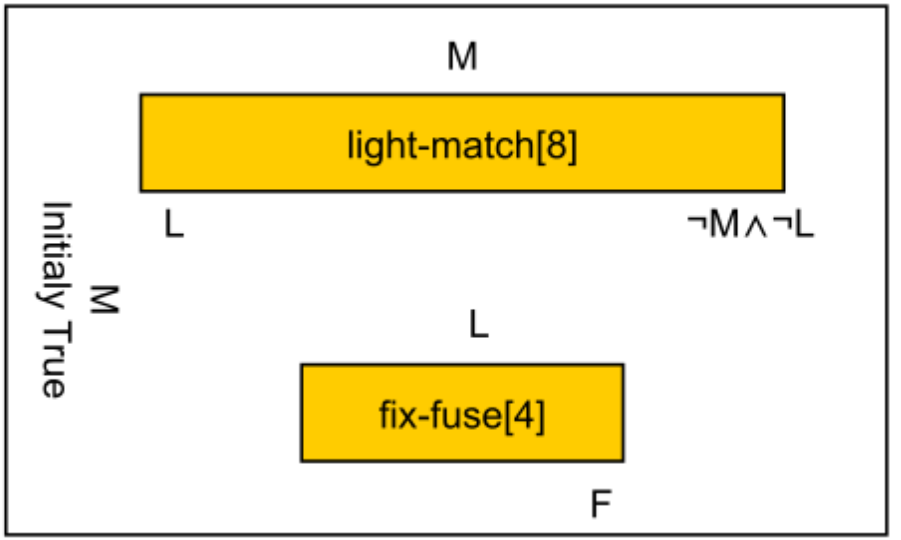
TLP-GP

Solving Temporally-Expressive Planning Problems


M
light-match[8]
L
¬M∧¬L
Initialy True
M
L
fix-fuse[4]
F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Initialy True
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TLP-GP

- Solves temporally-expressive planning problems
- Planning graph built until goal obtained
  - atemporal
- Solution extraction from planning graph
  - backwards
  - places temporal constraints between actions

Example

- $\prod = \langle O, I, G \rangle$
- $I = \{\}$
- $G = \{b, d, e\}$
- $O = \{(A, \{\}, \{a_{[0]}, \neg a_{[5]}, b_{[5]}, \neg d_{[5]}\}, 5);$
  $(B, \{a_{[0]}\}, \{c_{[0]}, d_{[4]}, \neg c_{[4]}\}, 4);$
  $(C, \{c_{[0]}\}, \{\neg b_{[1]}, e_{[1]}\}, 1)\}$

(<name>, <pre>, <eff>, <dur>)

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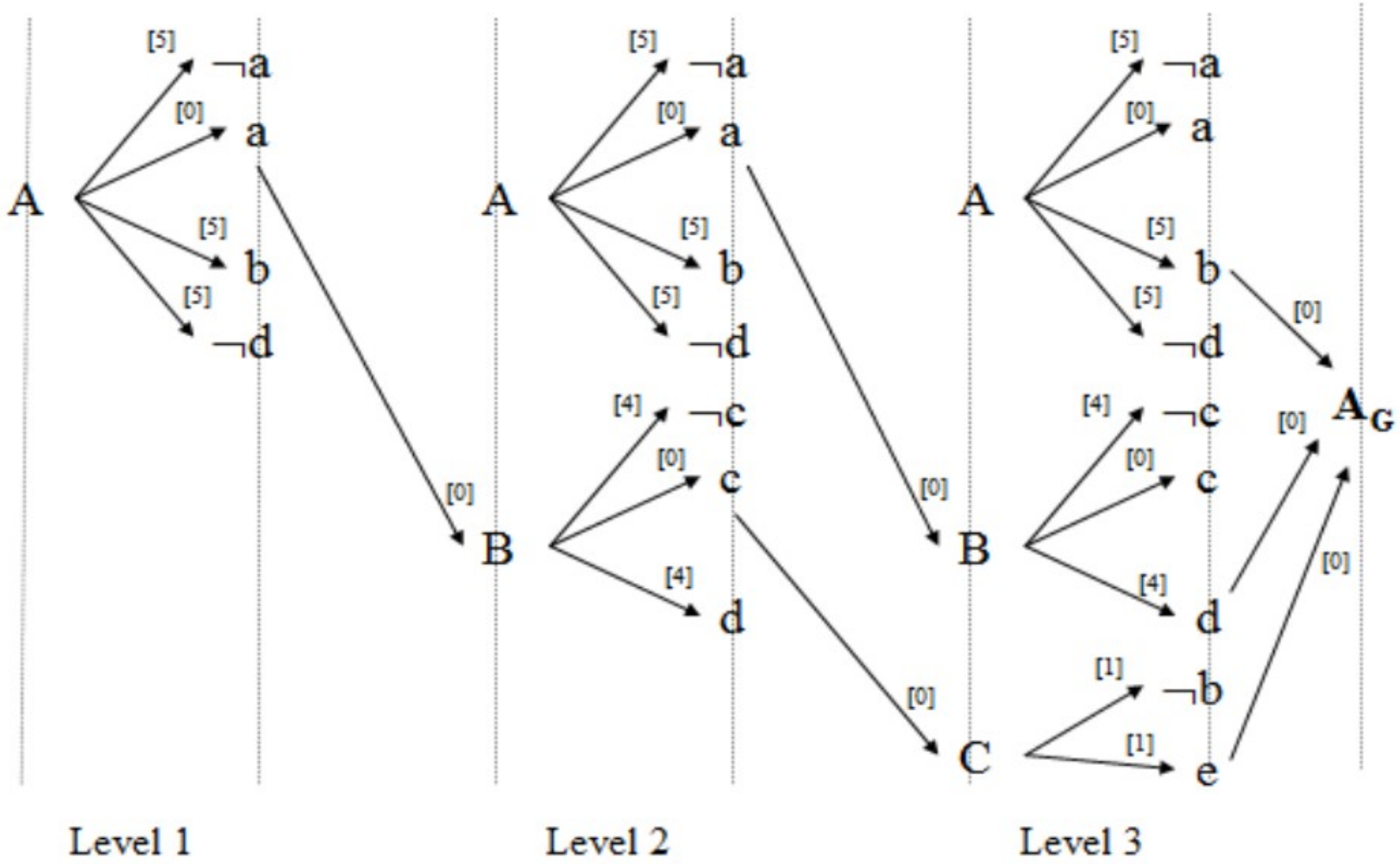
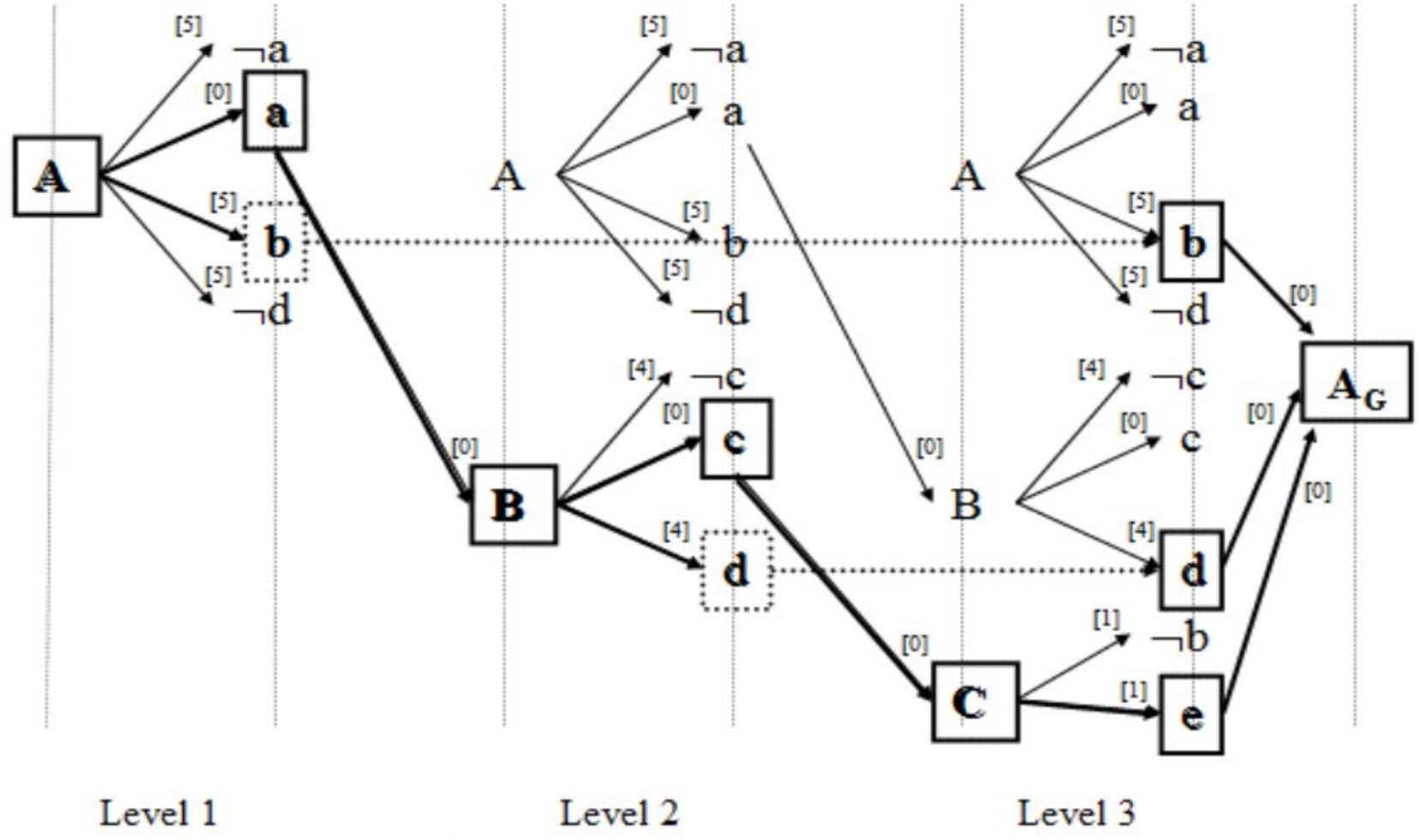


Maris, Régnier, 2008.

Example



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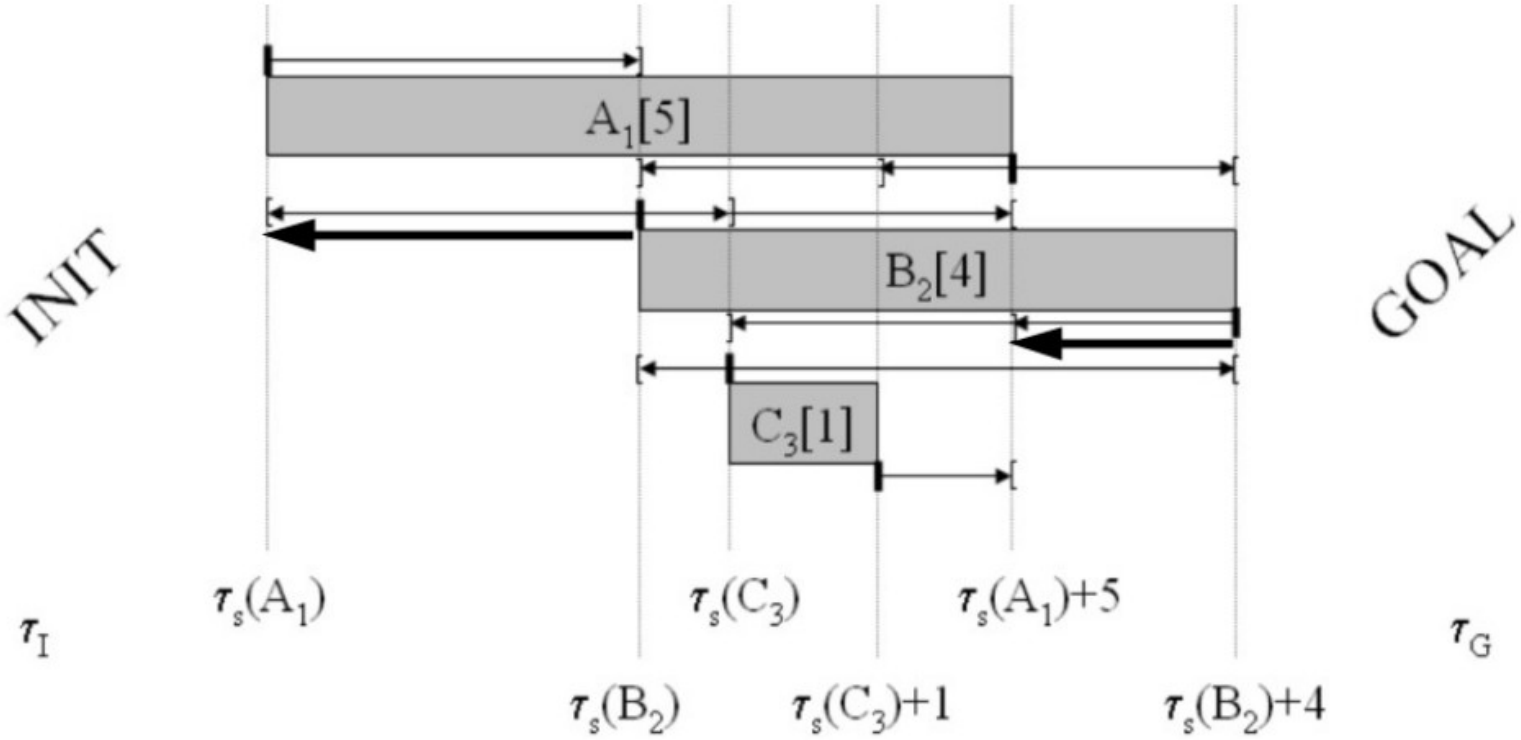

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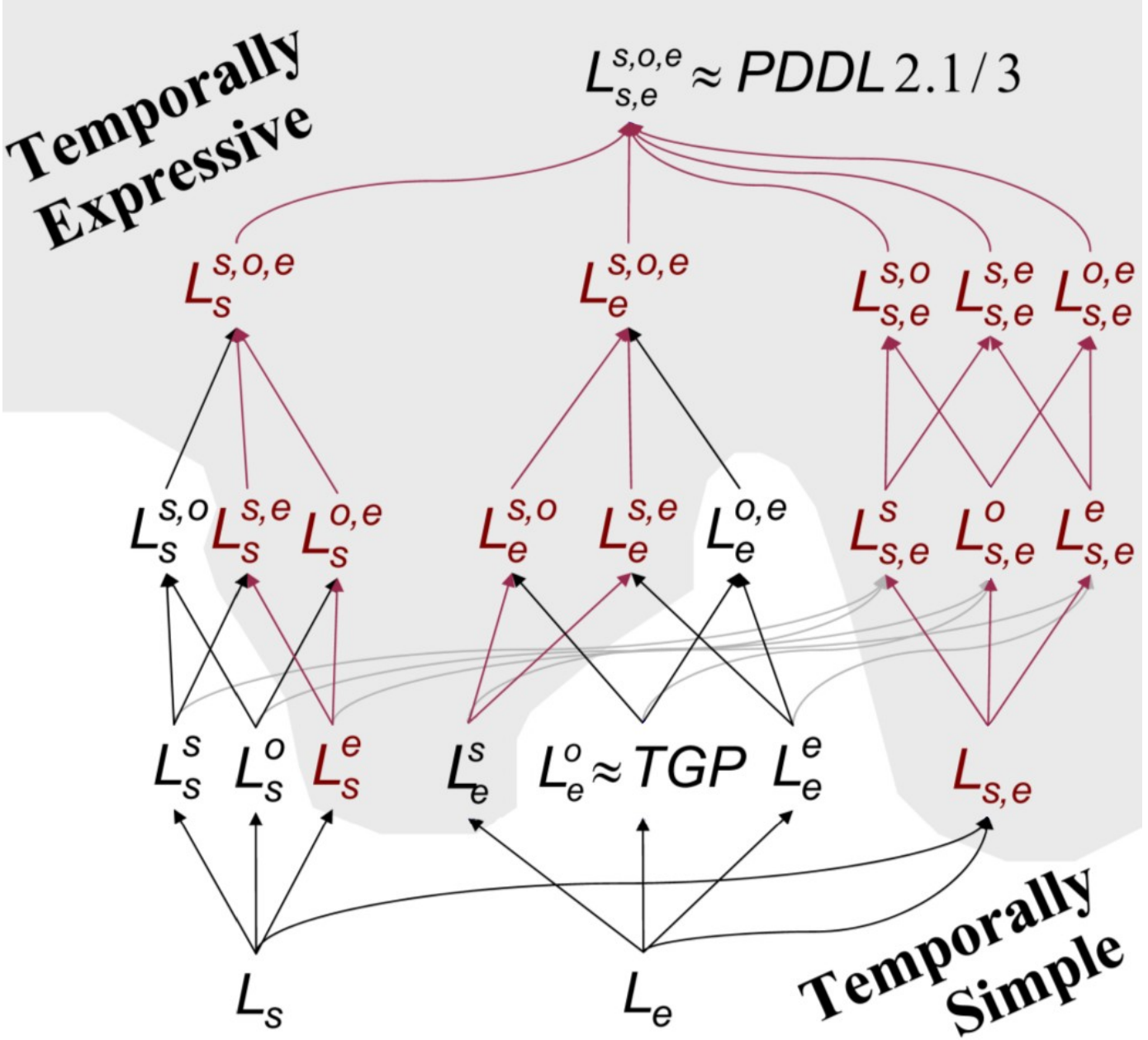
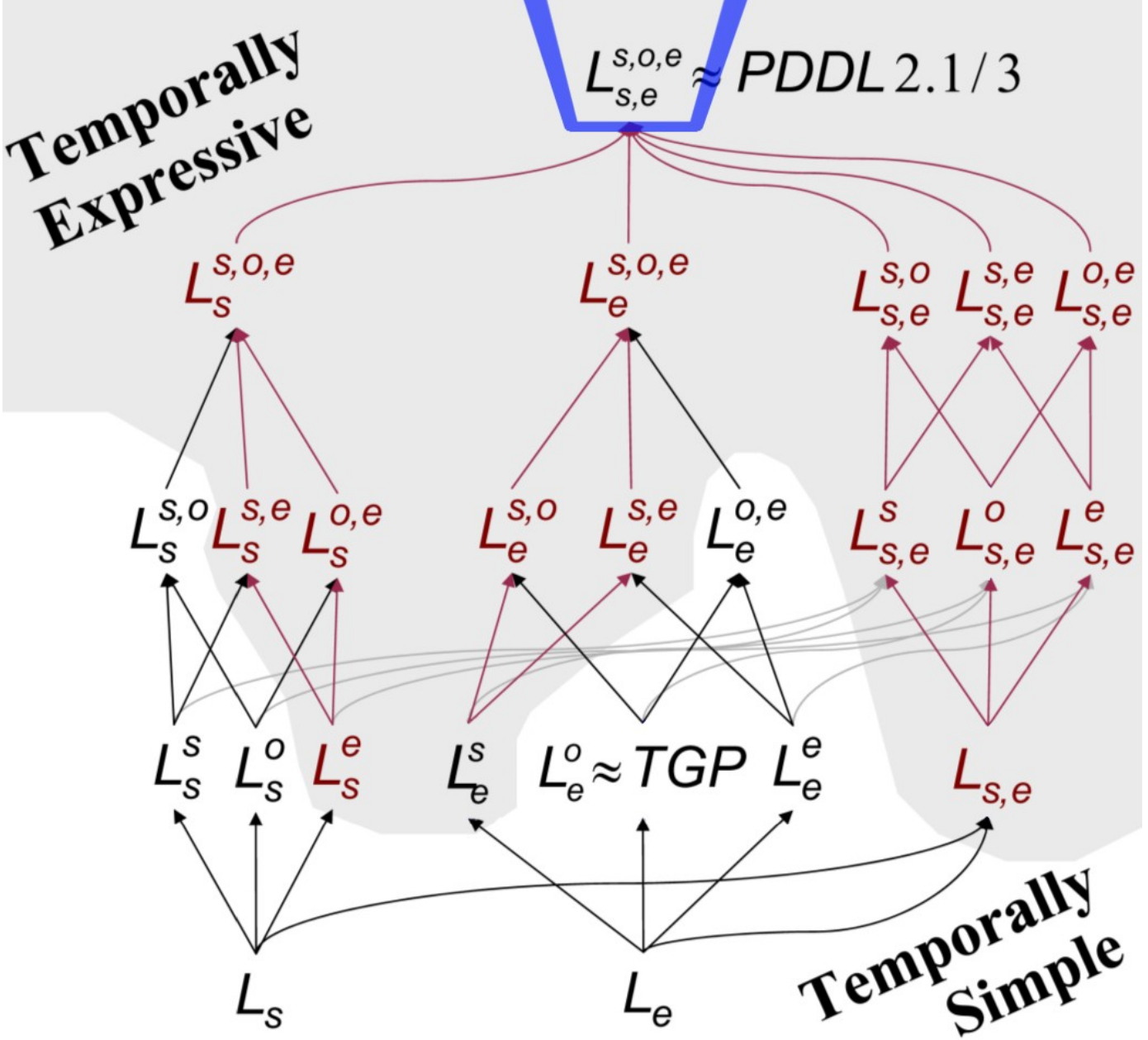


$L^{\text{preconditions}}_{\text{effects}}$

s "at-start"
e "at-end"
o: "over-all" (over the entire duration)

Cushing et al., 2007.



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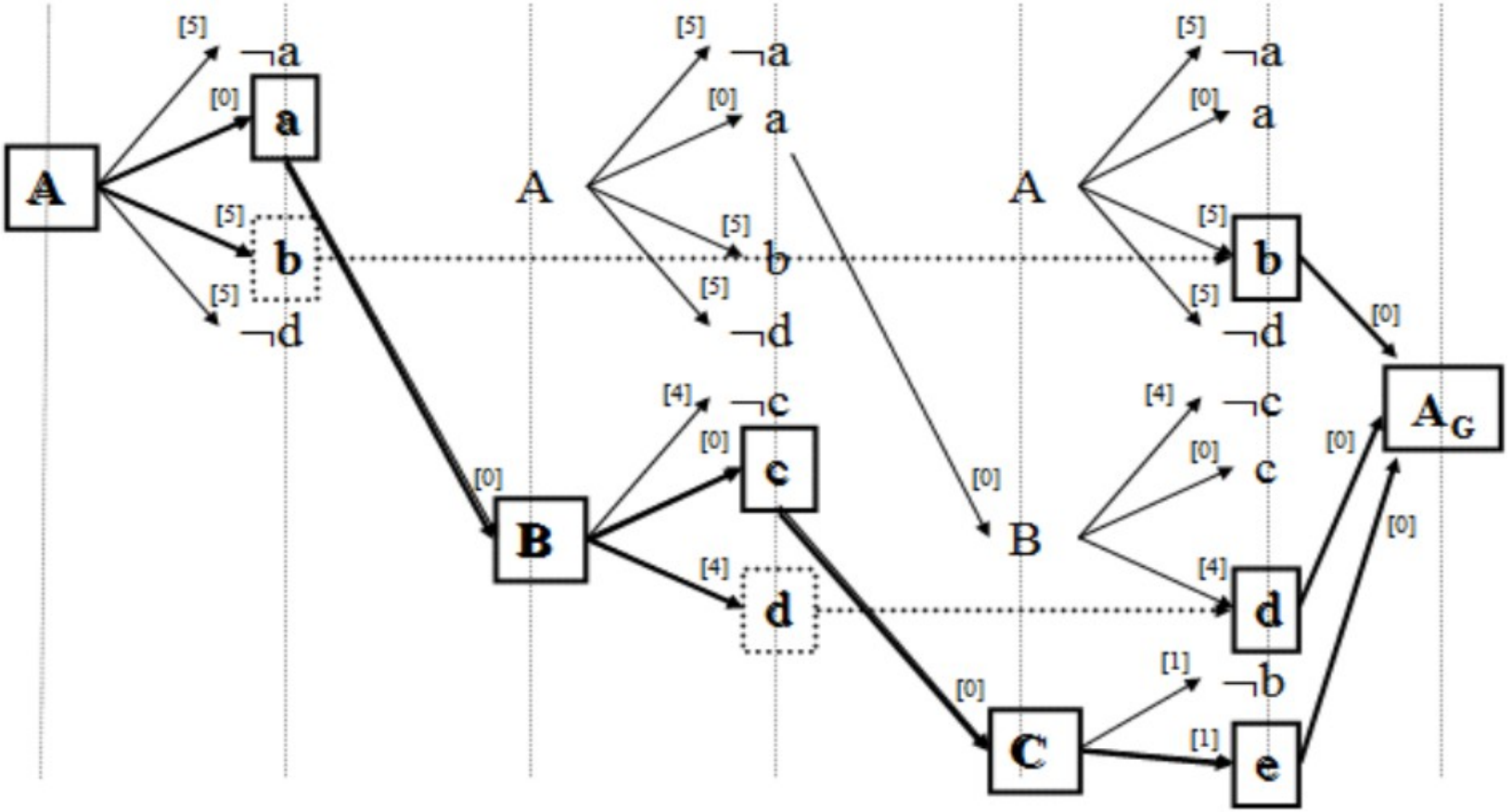

Level 1

Agenda	
a	$[\tau_s(A_1); \tau_s(B_2)]$
¬a	$[\tau_s(A_1)+5]$
b	$[\tau_s(A_1)+5]$ $[\tau_s(A_1)+5; \tau_G]$

Level 2

¬b	$[\tau_s(C_3)+1]$
c	$[\tau_s(B_2); \tau_s(C_3)]$
¬c	$[\tau_s(B_2)+4]$

Level 3

d	$[\tau_s(B_2)+4]$ $[\tau_s(B_2)+4; \tau_G]$
¬d	$[\tau_s(A_1)+5]$
e	$[\tau_s(C_3)+1; \tau_G]$

Maris, Régnier, 2008.