

# Classifying space for proper actions for groups admitting a strict fundamental domain

Tomasz Prytuła

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joint work with Nansen Petrosyan

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Outline

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- 1 Classifying space for proper actions  $\underline{E}G$

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- 4 Applications

## Classifying space for proper actions



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- ▶  $\underline{E}G$  always exists
- ▶ any two models for  $\underline{E}G$  are  $G$ -homotopy equivalent

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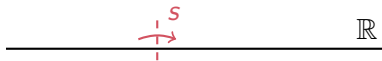
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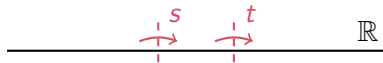
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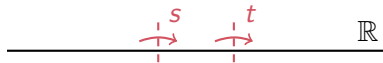


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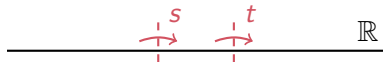
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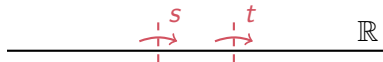
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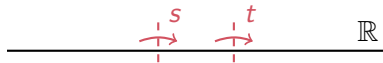
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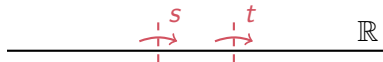
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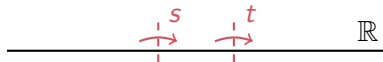
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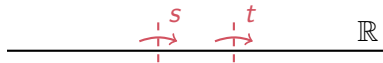
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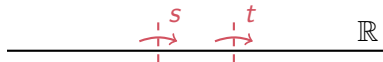
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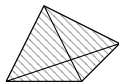
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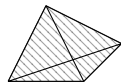
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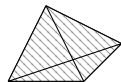


$$W = W_L = \langle s_i \in V(L) \mid s_i^2 = e, s_i s_j = s_j s_i \text{ iff } \{s_i, s_j\} \in E(L) \rangle$$

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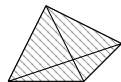
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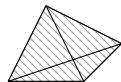
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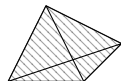
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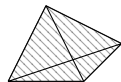
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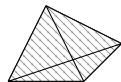
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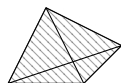
## Examples

$L$	$\Delta^n$	$(\Delta^n)^{(0)}$	$L_1 \sqcup L_2$	$L_1 * L_2$
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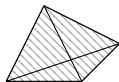
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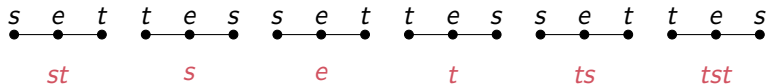


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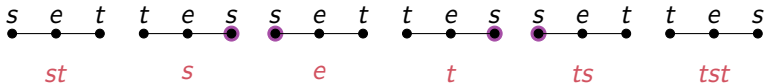


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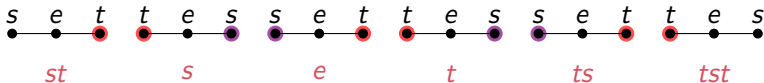


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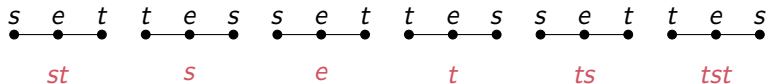


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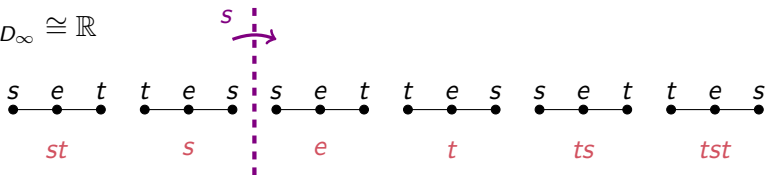


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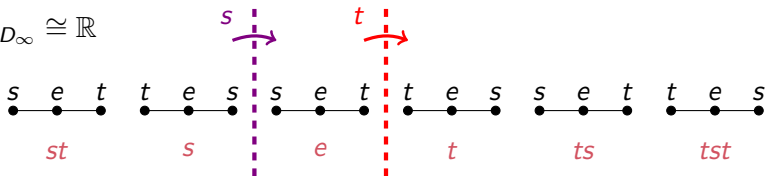


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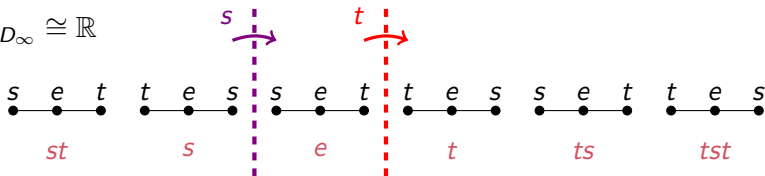


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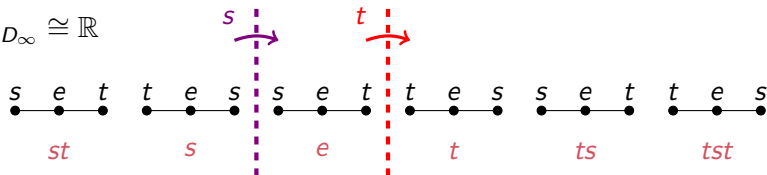


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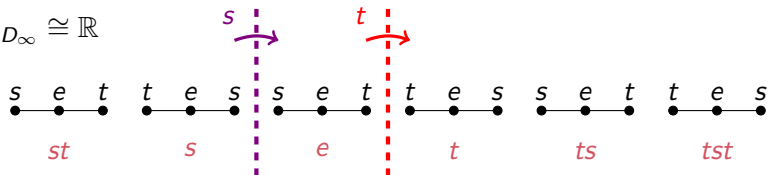


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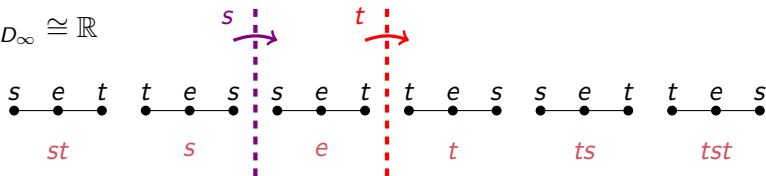
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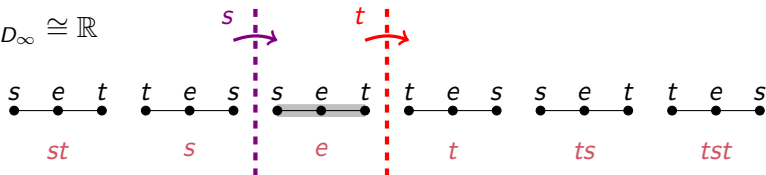
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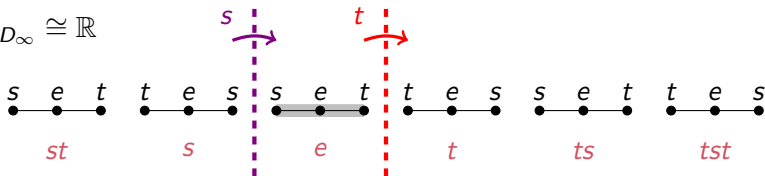
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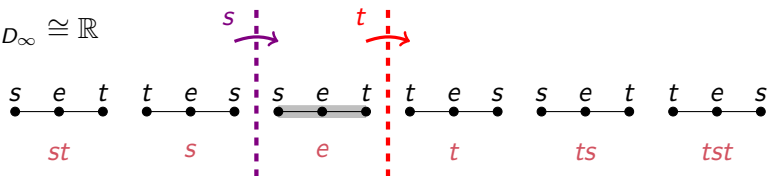
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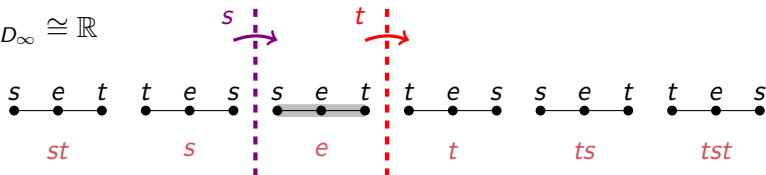
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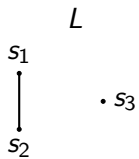
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# Davis complex for a Coxeter group

Example

# Davis complex for a Coxeter group

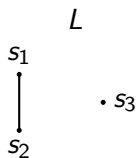
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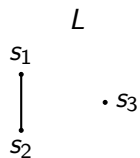
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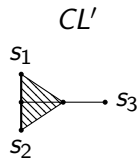
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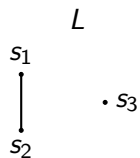


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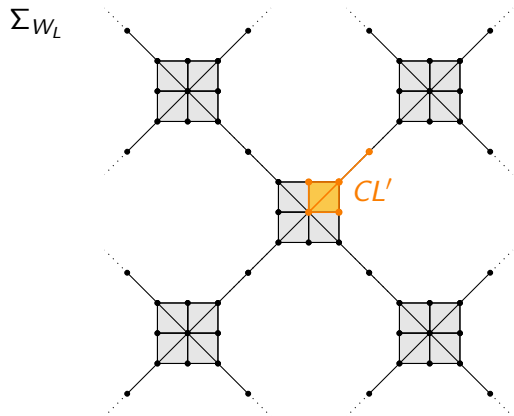
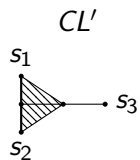


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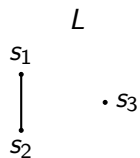


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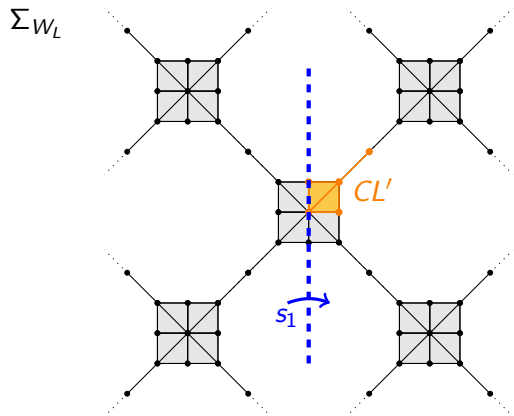
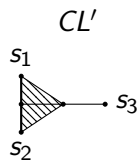


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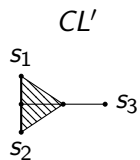
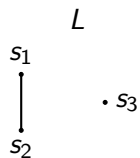


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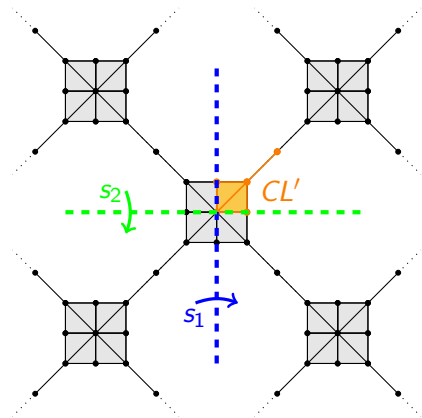
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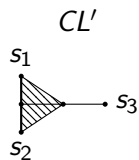
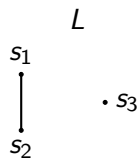
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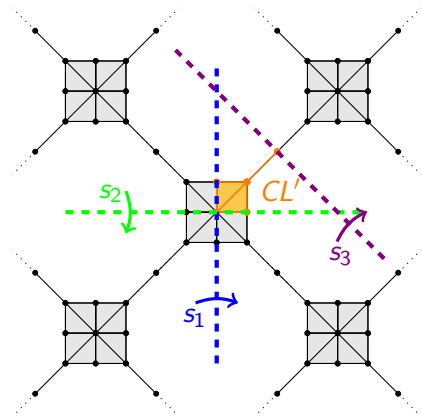
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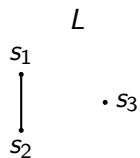
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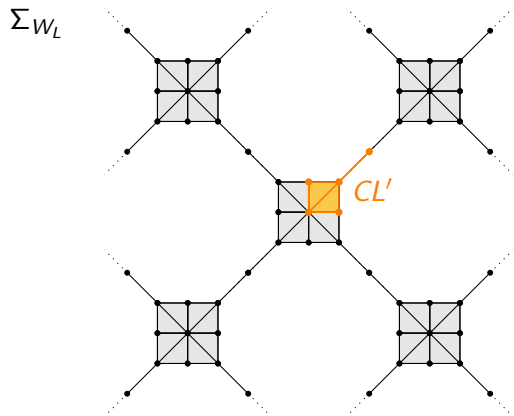
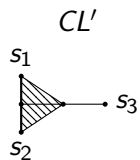


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(except it could be that  $\underline{\text{cd}}W_L = 2$  but  $\dim(\tilde{B}_{W_L}) = 3$ )

# Main theorem

## Theorem (Petrosyan-P.)

There exists a  $W_L$ -complex  $\tilde{B}_{W_L}$  ('Bestvina complex') such that:

1.  $\tilde{B}_{W_L}$  and  $\Sigma_{W_L}$  are  $W_L$ -homotopy equivalent

Therefore  $\tilde{B}_{W_L} \simeq \underline{E}W_L$

2.  $\dim(\tilde{B}_{W_L}) = \text{vcd}W_L = \underline{\text{cd}}W_L$

(except it could be that  $\underline{\text{cd}}W_L = 2$  but  $\dim(\tilde{B}_{W_L}) = 3$ )

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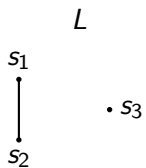
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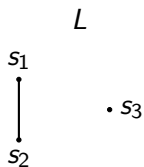
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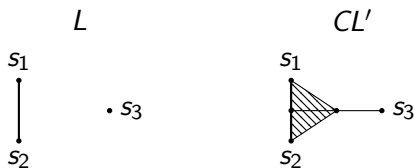
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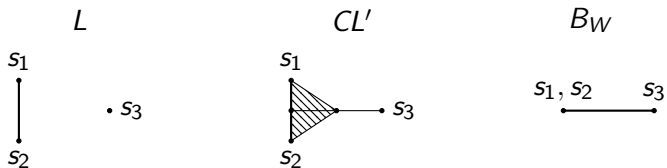
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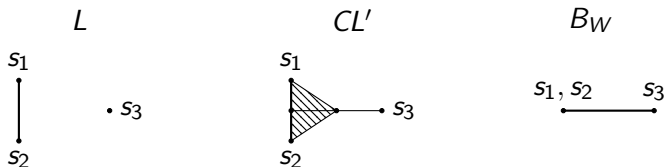


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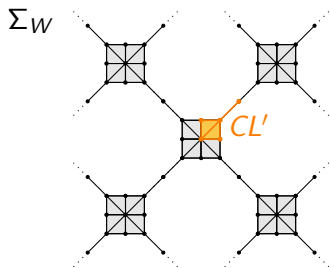


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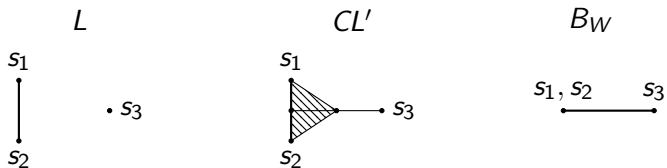


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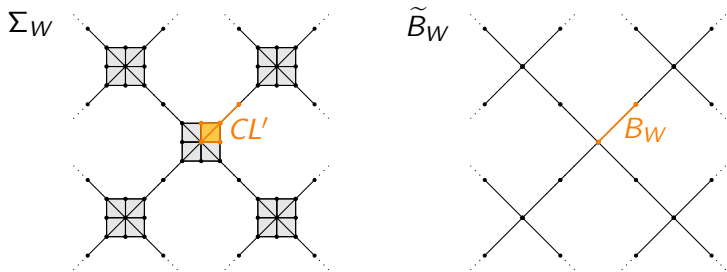


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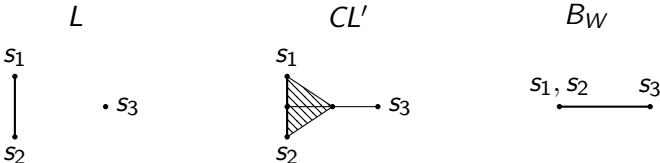


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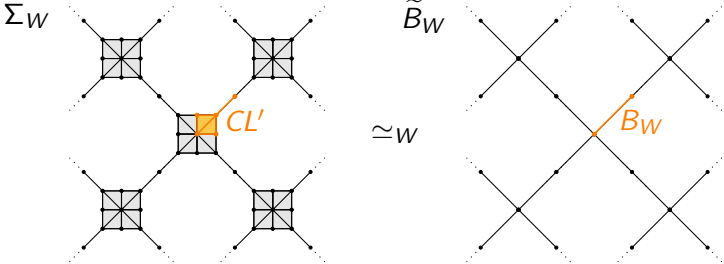


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proper, chamber-transitive

THANK YOU



