An equivariant foamy $\mathfrak{sl}_N$-homology

Louis-Hadrien Robert

Universität Hamburg
DER FORSCHUNG | DER LEHRE | DER BILDUNG

Emmanuel Wagner

UNIVERSITÉ DE BOURGOGNE

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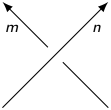
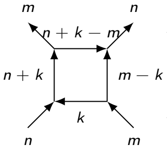
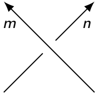
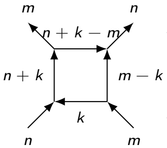
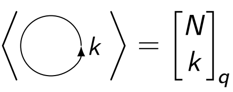
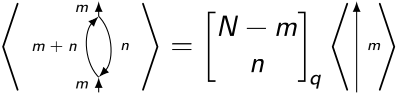
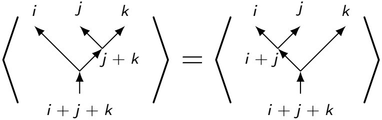
http://www.math.uni-hamburg.de/home/robert/bhktalk.pdf

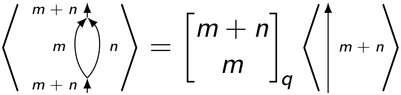
$\Big\langle$  $\Big\rangle = \displaystyle\sum_{k=\max(0,m-n)}^{m} (-1)^{m-k} q^{k-m} \Big\langle$  $\Big\rangle$

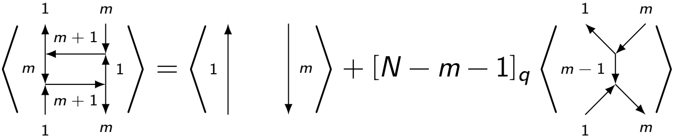
$\Big\langle$  $\Big\rangle = \displaystyle\sum_{k=\max(0,m-n)}^{m} (-1)^{m-k} q^{m-k} \Big\langle$  $\Big\rangle$

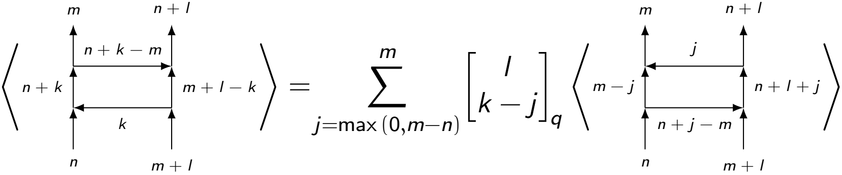

k
= [N k]_q


m
m + n
n
m
= [N − m n]_q
m


i j k
j + k
i + j + k
=
i j k
i + j
i + j + k

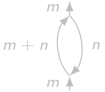

m + n
m
n
m + n
= [m + n m]_q
m + n


1 m
m + 1
m
1
m + 1
1 m
= 1 m + [N − m − 1]_q
1 m
m − 1
1 m


m n + l
n + k − m
n + k
m + l − k
k
n m + l
= Σ_{j=max(0,m−n)}^{m} [l k − j]_q
m n + l
j
m − j
n + l + j
n + j − m
n m + l

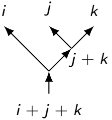
⟨ 

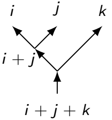
⟩ $= \begin{bmatrix} N \\ k \end{bmatrix}_q$

⟨ 

⟩ $= \begin{bmatrix} N-m \\ n \end{bmatrix}_q$ ⟨ 

⟩

⟨ 

⟩ = ⟨ 

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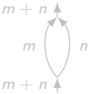
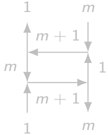
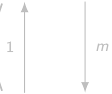
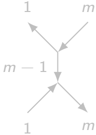
⟨ 

⟩ $= \begin{bmatrix} m+n \\ m \end{bmatrix}_q$ ⟨ 

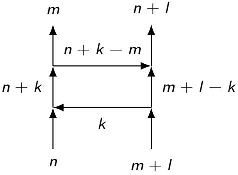
⟩

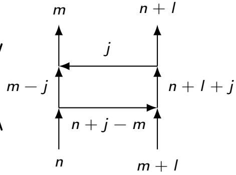
⟨ 

⟩ = ⟨ 

⟩ $+ [N-m-1]_q$ ⟨ 

⟩

⟨ 

⟩ $= \sum_{j=\max(0,m-n)}^{m} \begin{bmatrix} l \\ k-j \end{bmatrix}_q$ ⟨ 

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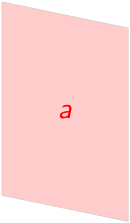
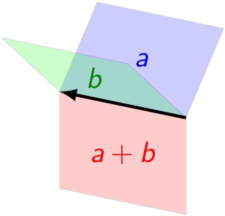
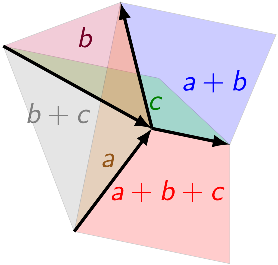
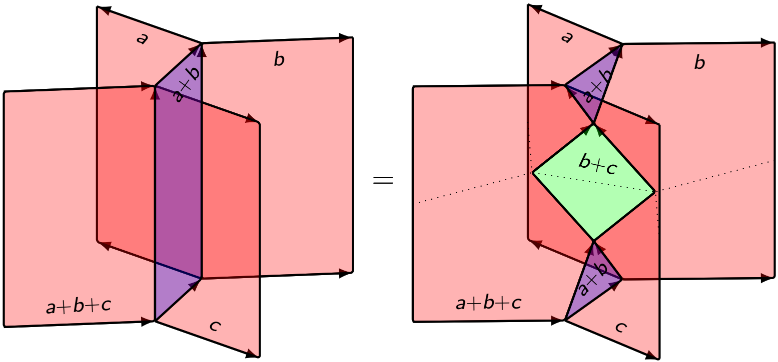
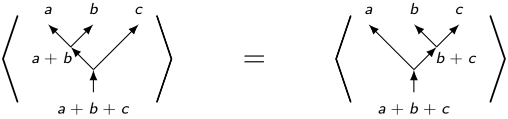
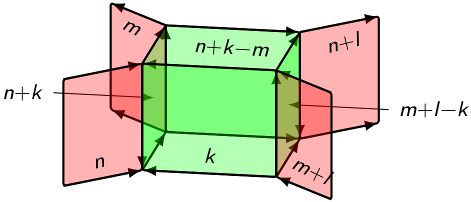

a


a
b
a + b


b
a + b
c
b + c
a
a + b + c

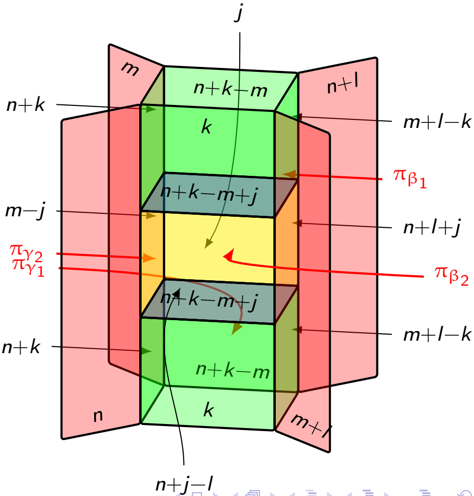

a
b
a+b
a+b+c
c
=
a
b
a+b
b+c
a+b
a+b+c
c

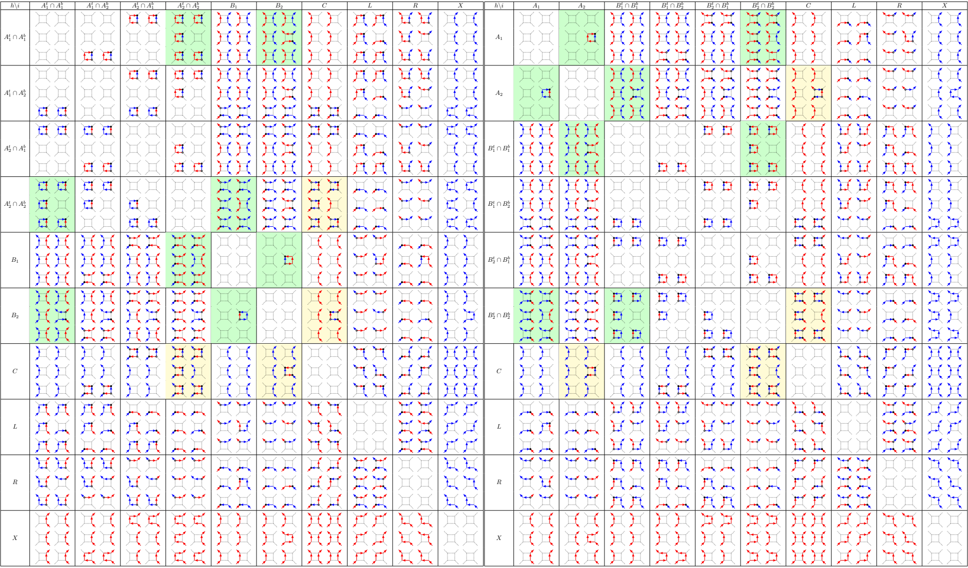

a
b
c
a + b
a + b + c
=
a
b
c
b + c
a + b + c



$$= \sum_{j=\max(0,m-n)}^{m} \; \sum_{\alpha \in T(k-j,\,l-k+j)}$$

$$(-1)^{|\alpha|+(l-k+j)(m-j)} \sum_{\substack{\beta_1,\beta_2\\ \gamma_1,\gamma_2}} c^{\alpha}_{\beta_1\beta_2}\, c^{\widehat{\alpha}}_{\gamma_1\gamma_2}$$





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Thank you!