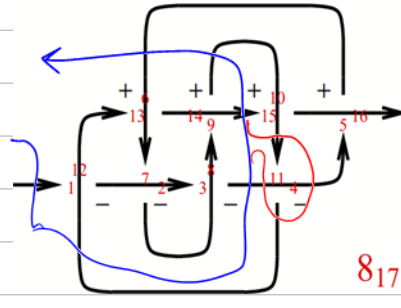
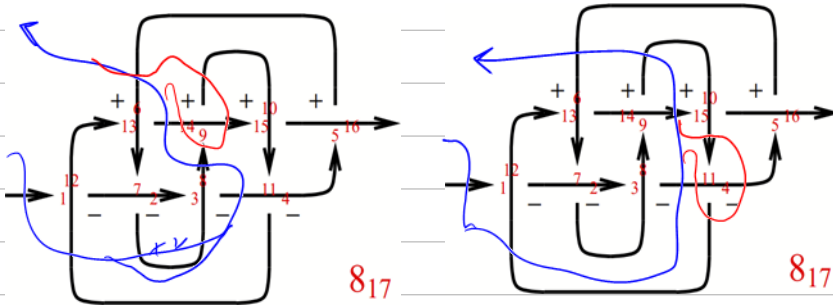
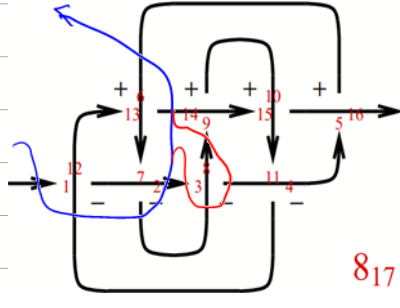
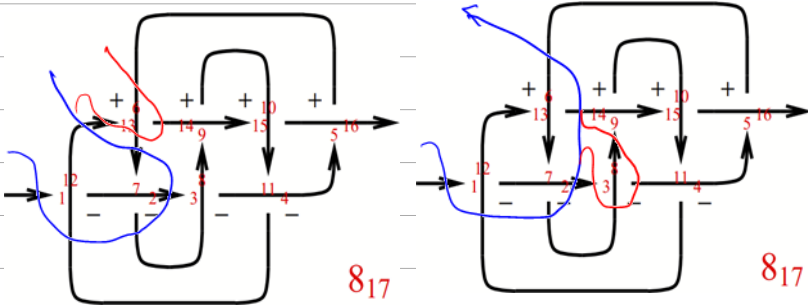
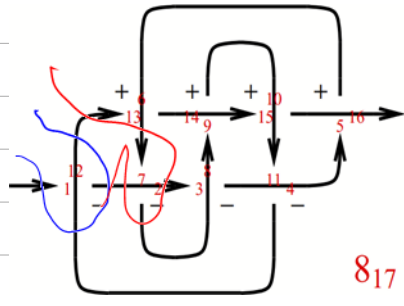
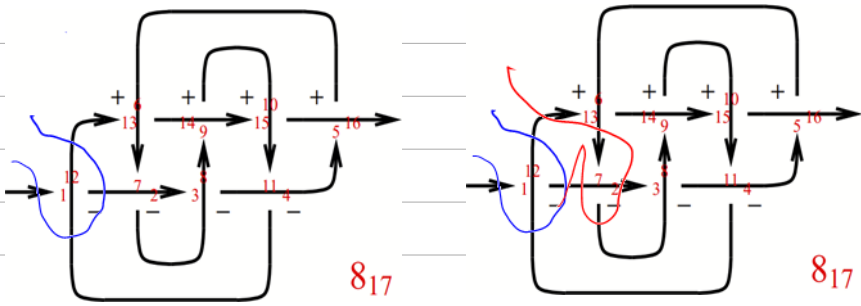


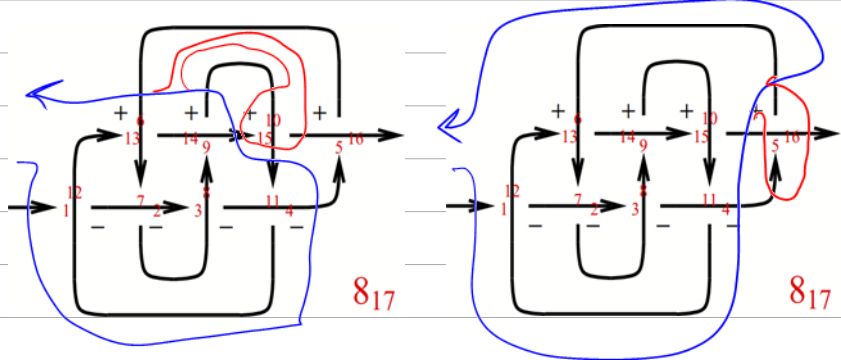
$$\begin{matrix} t_i & h_i & h_j \\ t_j & \begin{pmatrix} a & b & \theta \\ c & d & \epsilon \\ \phi & \psi & \xi \end{pmatrix} \end{matrix} \xrightarrow[\mu=1-b]{M_{jk}^{ij}} \begin{matrix} h_k \\ t_i \begin{pmatrix} c + ad/\mu & \epsilon + d\theta/\mu \\ \phi + a\psi/\mu & \xi + \theta\psi/\mu \end{pmatrix} \end{matrix}$$

$$\begin{matrix} 1 & 2 \\ \vdots & \vdots \\ \vdots & \vdots \\ \vdots & \vdots \end{matrix} \quad b + \frac{ad}{1-c}$$

$c_1 + c_2$

$$\begin{matrix} h_i & -1 & 0 \\ h_j & 0 & -1 \\ t_i & a & b \\ t_j & c & d \end{matrix} \begin{pmatrix} b-1/a & -1 \\ -1 & c(1-b)/a+d \end{pmatrix} \xrightarrow{\alpha = \frac{1-b}{a}} \begin{pmatrix} (b-1)/a \\ c(1-b)/a+d \end{pmatrix} \xrightarrow{\cdot \frac{a}{1-b}} \begin{pmatrix} -1 \\ c + \frac{ad}{1-b} \end{pmatrix}$$





$$h h h + t h h + t t t h$$

$$\quad \quad \quad -1 \quad \quad \quad -1$$

$$A B \bar{A}^T = A \bar{C}^T + C \bar{A}^T$$

```

T^:=T^-1;
<c_, d_>_c := ExpandModule[{e, f},
  Expand[c (d /. {T -> T^, t_ -> t_*, h_ -> h_*})] /.
  {t_* t_ -> 0, h_* h_ -> T - T^,
  (f : t | h)_j^* (e : t | h)_i -> If[Position[c, e][[1, 1]] < Position[c, f][[1, 1]],
    T - 1, 1 - T^]}];
UnitaryQ[gamma_T] := Module[{vs},
  vs = Table[-t_i + d_i gamma @ lambda /. T_ -> T, {i, gamma @ S}];
  And @@ Flatten@Table[Simplify[<vs[[i], vs[[j]]>, {e} == 0], {i, gamma @ n}, {j, gamma @ n}];
];

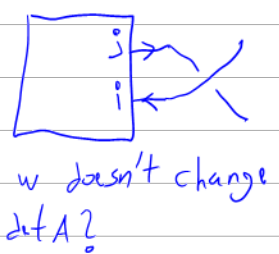
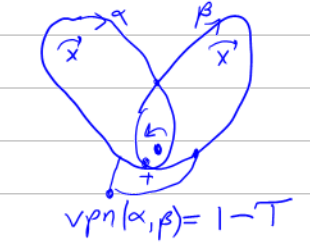
```

$$\begin{array}{ccc} -1 & 0 & 0 & a & b & c \\ 0 & -1 & 0 & d & e & f \\ 0 & 0 & -1 & h & i & j \\ -1 & 1 & & & & \end{array} \rightarrow \begin{array}{ccc} -1 & 0 & a & b & c \\ 0 & -1 & d & e & f \\ 0 & 0 & h-1 & i & j \\ \cancel{0} & \cancel{0} & \cancel{-1} & \cancel{0} & \cancel{0} \end{array} \rightarrow \begin{array}{ccc} -1 & 0 & 0 & b - \frac{ai}{h-1} & \frac{c-ja}{h-1} \\ 0 & -1 & 0 & e - \frac{id}{h-1} & f - \frac{jd}{h-1} \\ \cancel{0} & \cancel{0} & \cancel{h-1} & \cancel{i} & \cancel{j} \end{array}$$

Vortex pairing south



Vortex pairing north



		h		
		i	j	R
i		alpha	beta	epsilon
t		gamma	delta	0
R		phi	psi	zeta

 $\rightarrow$ 

		h		
		i	j	R
t		t alpha	t beta + (1-t)	t epsilon
t		gamma	delta	0
R		phi	psi	zeta