Generation der Sudokus von $L24_{eee}$ Januar 2015

Es werden Blockdarstellungen und Fixoperatoren für die 24 Sudokus der zeilenweise durchnummerierten Liste L24eee und deren vollständig reduzierte Formen angegeben.
Anders als im Urtext vom 07. 08. 2010 sind die lokalen zyklischen Zeilenoperatoren durch r bzw. rr und die zyklischen Spaltenoperatoren durch s bzw. ss notiert.

Blockdarstellung der Sudokus vom R-Typ und deren reduzierte Formen

$$\mathbf{A_1} = \begin{pmatrix} e & rrss\ e & rs\,e \\ rss\ e & e & rrss\ e \\ rrs\,e & rs\,e & e \end{pmatrix}, \qquad \varphi_{A1} = (r,r,r)(ss,s,s)R, \quad \text{wobei } e = \begin{pmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{pmatrix},$$

$$A_1^* = (1,rr,r)(1,s,ss)A1 = \begin{pmatrix} e & rr\ e & re \\ ss\,e & rrs\,e & rs\,e \\ s\,e & rrss\,e & rss\,e \end{pmatrix}, \quad \varphi_{A1*} = (ss,s,s)R$$

$$\mathbf{A_2} = \begin{pmatrix} e & rrs\,e & rs\,e \\ r\cdot s\,e & e & rr\cdot ss\,e \\ rrss\,e & rss\,e & e \end{pmatrix}, \qquad \varphi_{A2} = (r,r,r)(s,ss,s)R$$

$$A_2^* = (1,rr,r)(1,ss,ss) = \begin{pmatrix} e & rre & re \\ s\,e & rrss\,e & rs\,e \\ ss\,e & srr\,e & rss\,e \end{pmatrix}, \quad \varphi_{A2*} = (s,ss,s)R$$

$$\mathbf{A_3} = \begin{pmatrix} e & rrs\,e & rs\,e \\ rss\,e & e & rrss\,e \\ rrs\,e & rss\,e & e \end{pmatrix}, \qquad \varphi_{A3} = (r,r,r)(ss,ss,s)R$$

$$A_3^* = (1,rr.r)(1,ss\ ss)A_{A3} = \begin{pmatrix} e & rr\,e & re \\ ss\,e & rrss\,e & rs\,e \\ s\,e & rrs\,e & rss\,e \end{pmatrix}, \quad \varphi_{A3*} = (ss,ss,s)\ R$$

$$\mathbf{A_4} = \begin{pmatrix} e & rss\,e & rrs\,e \\ rrss\,e & e & rss\,e \\ rs\,e & rrs\,e & e \end{pmatrix}, \qquad \varphi_{A4} = (rr,rr,rr)(ss,s,s)R$$

$$A_4^* = (1,r,rr)(1,s,ss)\ A_4 = \begin{pmatrix} e & r\,e & rr\,e \\ ss\,e & rs\,e & rrs\,e \\ s\,e & rss\,e & rrss\,e \end{pmatrix}, \quad \varphi_{A4*} = (ss,s,s)R\ .$$

$$\mathbf{A_5} = \begin{pmatrix} e & rse & rrse \\ rrse & e & rsse \\ rsse & rrsse & e \end{pmatrix}, \qquad \varphi_{A5} = (rr,rr,rr)(s,ss,s)R$$

$$A_5^* = (1,r,rr)(1,ss,ss)\,A_5 = \begin{pmatrix} e & re & rre \\ se & rsse & rrse \\ sse & rse & rrsse \end{pmatrix}, \quad \varphi_{A5*} = (s,ss,s)R\ .$$

$$\mathbf{A_6} = \begin{pmatrix} e & rse & rrse \\ rrsse & e & rsse \\ rse & rrsse & e \end{pmatrix}, \qquad \varphi_{A6} = (rr,rr,rr)(ss,ss,s)R\ .$$

$$A_6^* = (1,r,rr)(1,s,ss)\,A_6 = \begin{pmatrix} e & re & rre \\ sse & rsse & rrse \\ se & rse & rrsse \end{pmatrix}, \quad \varphi_{A6*} = (ss,s,s)R\ .$$

$$\mathbf{A_7} = \begin{pmatrix} e & rrsse & rsse \\ rse & e & rrse \\ rrsse & rse & e \end{pmatrix}, \qquad \varphi_{A7} = (r,r,r)(s,s,ss)R\ .$$

$$A_7^* = (1,rr,r)(1,s,s)\,A_7 = \begin{pmatrix} e & rre & re \\ se & rrse & rsse \\ sse & rrsse & rse \end{pmatrix}, \quad \varphi_{A7*} = (s,s,ss)R\ .$$

$$\mathbf{A_8} = \begin{pmatrix} e & rrsse & rsse \\ rsse & e & rrse \\ rrse & rse & e \end{pmatrix}, \qquad \varphi_{A8} = (r,r,r)(ss,s,ss)R\ .$$

$$A_8^* = (1,rr,r)(1,s,s)\,A_8 = \begin{pmatrix} e & rre & re \\ sse & rrse & rsse \\ se & rrsse & rse \end{pmatrix}, \quad \varphi_{A8*} = (ss,s,s)R\ .$$

$$\mathbf{A_9} = \begin{pmatrix} e & rrse & rsse \\ rse & e & rrse \\ rrsse & rsse & e \end{pmatrix}, \qquad \varphi_{A9} = (r,r,r)(s,ss,ss)R\ .$$

$$A_9^* = (1,rr,r)(1,ss,s)A_9 = \begin{pmatrix} e & rre & re \\ se & rrsse & rsse \\ sse & rrse & rse \end{pmatrix}, \qquad \varphi_{A9*} = (s,ss,ss)R$$

$$\mathbf{A_{10}} = \begin{pmatrix} e & rsse & rrsse \\ rrse & e & rse \\ rsse & rrse & e \end{pmatrix}, \qquad \varphi_{A10} = (rr,rr,rr)(s,s,ss)R\ .$$

$$A_{10}^* = (1,r,rr)(1,s,s)A_{10} = \begin{pmatrix} e & re & rre \\ se & rse & rrsse \\ sse & rsse & srre \end{pmatrix}, \qquad \varphi_{A10}^* = (s,s,ss)R$$

$$\mathbf{A_{11}} = \begin{pmatrix} e & rsse & rrsse \\ rrsse & e & rse \\ rse & rrse & e \end{pmatrix}, \qquad \varphi_{A11} = (rr,rr,rr)(ss,s,ss)R\ .$$

$$A_{11}^* = (1,r,rr)(1,s,s)A_{11} = \begin{pmatrix} e & re & rre \\ sse & rse & rrsse \\ se & rsse & rrse \end{pmatrix}, \qquad \varphi_{A11}^* = (ss,s,ss)R$$

$$\mathbf{A_{12}} = \begin{pmatrix} e & rse & rrsse \\ rrse & e & rse \\ rsse & rrsse & e \end{pmatrix}, \qquad \varphi_{A12} = (rr,rr,rr)(s,ss,ss)R\ .$$

$$A_{12}^* = (1,r,rr)(1,ss,s)A_{12} = \begin{pmatrix} e & re & rre \\ se & rsse & rrsse \\ sse & rse & rrse \end{pmatrix}, \qquad \varphi_{A12}^* = (s,ss,ss)R$$

Durch den Operator R_1S_1 vermittelte Partnerschaften:
$A_2 \sim A_6$, $A_5 \sim A_3$, $A_7 \sim A_{11}$, $A_9 \sim A_4$, $A_{10} \sim A_8$, $A_{12} \sim A_1$.

Blockdarstellung der Sudokus vom S-Typ und deren reduzierte Formen

$$\mathbf{A_{13}} = \begin{pmatrix} e & rrss\ e & rs\,e \\ rs\ e & e & rrss\ e \\ rss\,e & rrs\,e & e \end{pmatrix}, \qquad \varphi_{A13} = (rr,rr,r)(ss,ss,ss)S$$

$$A_{13}^* = (1,rr,rr)(1,s,ss)A_{13} = \begin{pmatrix} e & rr\ e & re \\ se & rrse & rse \\ ss\,e & rss\,e & rrsse \end{pmatrix}, \qquad \varphi_{A13^*} = (ss,s,s)S$$

$$\mathbf{A_{14}} = \begin{pmatrix} e & rss\,e & rrs\,e \\ r\cdot s\,e & e & rr\cdot ss\,e \\ rrss\,e & rs\,e & e \end{pmatrix}, \qquad \varphi_{A14} = (r,rr,rr)(ss,ss,ss)S$$

$$A_{14}^* = (1,rr,r)(1,s,ss)\ A_{14} = \begin{pmatrix} e & r\,e & rre \\ s\,e & rrse & rse \\ sse & rrss\,e & rsse \end{pmatrix}, \qquad \varphi_{A14^*} = (r,rr,rr)S$$

$$\mathbf{A_{15}} = \begin{pmatrix} e & rsse & rrs\,e \\ rs\,e & e & rrss\,e \\ rss\,e & rrs\,e & e \end{pmatrix}, \qquad \varphi_{A15} = (r,rr,r)(ss,ss,ss)S$$

$$A_{15}^* = (1,rr.rr)(1,s,ss)A_{A15} = \begin{pmatrix} e & r\,e & rre \\ s\,e & rrse & rs\,e \\ ss\,e & rsse & rrsse \end{pmatrix}, \qquad \varphi_{A15^*} = (r,rr,r)S$$

$$\mathbf{A_{16}} = \begin{pmatrix} e & rrss\,e & rs\,e \\ rrs\,e & e & rss\,e \\ rrss\,e & rs\,e & e \end{pmatrix}, \qquad \varphi_{A16} = (rr,r,rr)(ss,ss,ss)S$$

$$A_{16}^* = (1,r,r)(1,s,ss)\ A_{16} = \begin{pmatrix} e & rre & r\,e \\ se & rse & rrs\,e \\ sse & rrss\,e & rsse \end{pmatrix}, \qquad \varphi_{A16^*} = (rr,r,rr)S\ .$$

$$\mathbf{A_{17}} = \begin{pmatrix} e & rrss\,e & rs\,e \\ rrs\,e & e & rss\,e \\ rss\,e & rrs\,e & e \end{pmatrix}, \qquad \varphi_{A17} = (rr,r,r)(ss,ss,ss)S$$

A_{17}*= (1,r,rr)(1,s,ss) A_{17} = $\begin{pmatrix} e & rre & re \\ se & rse & rrse \\ sse & rsse & rrsse \end{pmatrix}$, φ_{A17*} = (rr,r,r)S

A_{18} = $\begin{pmatrix} e & rsse & rrse \\ rrse & e & rsse \\ rrsse & rse & e \end{pmatrix}$, φ_{A18} = (r,r,rr)(ss,ss,ss)S

A_{18}*= (1,r,r)(1,s,ss) A_{18} = $\begin{pmatrix} e & re & rre \\ se & rse & rrse \\ sse & rrsse & rsse \end{pmatrix}$, φ_{A18*} = (r,r,rr)S

A_{19} = $\begin{pmatrix} e & rrse & rsse \\ rsse & e & rrse \\ rse & rrsse & e \end{pmatrix}$, φ_{19} = (rr,rr,r)(s,s,s)S

A_{19}*= (1,rr,rr)(1,ss,s) A_{19} = $\begin{pmatrix} e & rre & re \\ sse & rrsse & rsse \\ se & rse & rrse \end{pmatrix}$, φ_{A19*} = (rr,rr,r)S

A_{20} = $\begin{pmatrix} e & rse & rrsse \\ rsse & e & rrse \\ rrse & rsse & e \end{pmatrix}$, φ_{A20} = (r,rr,rr)(s,s,s)S

A_{20}*= (1,rr,r)(1,ss,s) A_8 = $\begin{pmatrix} e & re & rre \\ sse & rrsse & rsse \\ se & rrse & rse \end{pmatrix}$, φ_{A20*} = (r,rr,rr)R .

A_{21} = $\begin{pmatrix} e & rse & rrsse \\ rsse & e & rrse \\ rse & rrsse & e \end{pmatrix}$, φ_{A21} = (r,rr,r)(s,s,s)R .

A_{21}* = (1,rr,rr)(1,ss,s)A_{21} = $\begin{pmatrix} e & re & rre \\ sse & rrsse & rsse \\ se & rse & rrse \end{pmatrix}$, φ_{A21*} = (r,rr,r)S

$$\mathbf{A_{22}} = \begin{pmatrix} e & rrs\,e & rss\,e \\ rrss\,e & e & rs\,e \\ rrse & rsse & e \end{pmatrix}, \qquad \varphi_{A22} = (rr,r,rr)(s,s,s)S$$

$$A_{22}^* = (1,r,r)(1,s,s)A_{10} = \begin{pmatrix} e & rr\,e & re \\ ss\,e & rsse & rrsse \\ se & rrse & sre \end{pmatrix}, \qquad \varphi_{A22*} = (rr,r,rr)S$$

$$\mathbf{A_{23}} = \begin{pmatrix} e & rrs\,e & rss\,e \\ rrss\,e & e & rs\,e \\ rs\,e & rrss\,e & e \end{pmatrix}, \qquad \varphi_{A23} = (rr,r,r)(s,s,s)S$$

$$A_{23}^* = (1,r,rr)(1,ss,s)A_{23} = \begin{pmatrix} e & rre & re \\ ss\,e & rsse & rrss\,e \\ s\,e & rs\,e & rrse \end{pmatrix}, \qquad \varphi_{A23*} = (rr,r,r)S$$

$$\mathbf{A_{24}} = \begin{pmatrix} e & rs\,e & rrss\,e \\ rrss\,e & e & rs\,e \\ rrs\,e & rss\,e & e \end{pmatrix}, \qquad \varphi_{A24} = (r,r,rr)(s,s,s)S$$

$$A_{24}^* = (1,r,rr)(1,ss,s)A_{24} = \begin{pmatrix} e & r\,e & rre \\ ss\,e & rsse & rrsse \\ se & rrse & rse \end{pmatrix}, \qquad \varphi_{A24*} = (r,r,rr)S$$

Durch den Operator R_1S_1 vermittelte Partnerschaften:
$A_{13} \sim A_{21}$, $A_{14} \sim A_{23}$, $A_{15} \sim A_{19}$, $A_{16} \sim A_{24}$, $A_{17} \sim A_{20}$, $A_{18} \sim A_{22}$.

Der Struktur der zugehörigen reduzierten Sudokus entnimmt man, dass es jeweils genau 12 normale Fixsudokus vom R-Typ und genau 12 Fixsudokus vom S-Typ gibt.

Durch Transponieren und Renormierem anhand der Ziffernpermutation α = (24)(37)(68) bestimmten Partnerschaften zwischen den reduzierten Formen der Fixsudokus vom R-Typ und den reduzierten Formen der Fixsudokus vom S-Typ:
$A^*_4 \sim A^*_{17}$, $A^*_5 \sim A^*_{15}$, $A^*_6 \sim A^*_{13}$, $A^*_{10} \sim A^*_{18}$, $A^*_{11} \sim A^*_{16}$, $A^*_{12} \sim A^*_{14}$.
$A^*_1 \sim A^*_{23}$, $A^*_2 \sim A^*_{21}$, $A^*_3 \sim A^*_{19}$, $A^*_7 \sim A^*_{24}$, $A^*_8 \sim A^*_{22}$, $A^*_9 \sim A^*_{20}$.