Exchangement Lemma (Lemma 4.3.2)

If the following SLD resolution steps are possible

$$\begin{array}{ccc} \{\neg A_1, \ldots, \underline{\neg A_i}, \ldots, \neg A_j, \ldots, \neg A_k\} & & \{\underline{B}, \neg C_1, \ldots, \neg C_n\} \\ \Big| & \diagdown & \\ \sigma_1(\{\neg A_1, \ldots, \neg C_1, \ldots, \neg C_n, \ldots, \underline{\neg A_j}, \ldots, \neg A_k\}) & & \{\underline{D}, \neg E_1, \ldots, \neg E_m\} \\ \Big| & \diagdown & \\ \sigma_2(\sigma_1(\{\neg A_1, \ldots, \neg C_1, \ldots, \neg C_n, \ldots, \neg E_1, \ldots, \neg E_m, \ldots, \neg A_k\})) & & \end{array}$$

then the following SLD resolution steps are possible as well:

$$\begin{array}{ccc} \{\neg A_1, \ldots, \neg A_i, \ldots, \underline{\neg A_j}, \ldots, \neg A_k\} & & \{\underline{D}, \neg E_1, \ldots, \neg E_m\} \\ \Big| & \diagdown & \\ \sigma'_1(\{\neg A_1, \ldots, \underline{\neg A_i}, \ldots, E_1, \ldots, \neg E_m \ \ldots, \neg A_k\}) & & \{\underline{B}, \neg C_1, \ldots, \neg C_n\} \\ \Big| & \diagdown & \\ \sigma'_2(\sigma'_1(\{\neg A_1, \ldots, \neg C_1, \ldots, \neg C_n, \ldots, \neg E_1, \ldots, \neg E_m, \ldots, \neg A_k\})) & & \end{array}$$

Here, $\sigma'_2 \circ \sigma'_1 = \nu \circ \sigma_2 \circ \sigma_1$ for a variable renaming ν.