$$1 rac{\int\limits_{1}^{\sigma_{1}} \int\limits_{1}^{\sigma_{2}} \cdots \int\limits_{1}^{\sigma_{n-2}} n}{n} \sim f^{a_{1}a_{\sigma_{1}}b_{1}}f^{b_{1}a_{\sigma_{2}}b_{2}} \dots f^{b_{n-3}a_{\sigma_{n-2}}a_{n}}$$