Let $F$ be a closed oriented surface. A simple diagram on $F$ is a disjoint collection of essential simple closed curves. Dehn-Thurston coordinates for the simple diagrams on $F$ are determined by a pants decomposition $\mathcal{P} = \{P_i\}$ where the $P_i$ is a collection of disjoint simple closed curves that cut $F$ into pairs of pants, and an embedding $\mathcal{D}$ of the dual graph of the decomposition. The coordinates consist of a $6g - 6$-tuple of numbers $(n_1, \ldots, n_{3g-3}, t_1, \ldots, t_{3g-3})$. If $S$ is a simple diagram then $n_i(S)$ is the geometric intersection number of $S$ with $P_i$ and $t_i(S)$ is the number of times that a standard model of $S$ twists around $P_i$ with sign.

We say the diagram $S$ is triangular if whenever $P_i, P_j$ and $P_k$ bound a pair of pants, the numbers $n_i(S), n_j(S)$ and $n_k(S)$ satisfy all triangle inequalities.

In this talk I will prove that given any finite collection of simple diagrams there is a choice of Dehn-Thurston coordinates so that all the diagrams are triangular. (Received May 01, 2017)