Summary for Talks at the Reading Seminar on Deng-Hani-Ma

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The talks will be completely focused on the *cutting algorithm*, which is the most novel and complex part of Deng-Hani-Ma. A brief reading of the short note *Toy model algorithm* (at Deng's homepage), or knowledge on the contents covered by the short courses given by Deng and Ma, is highly recommended but not necessary. I will try to make the talks as self-contained as possible.

In their short courses and short notes, they have explained the cutting algorithm using several toy models under several simplifications. The goal of the talks will be the following.

- Under the full setting of their paper (including *overlaps and degeneracy*), I will explain the main ideas of the cutting algorithms, and give a complete proof to a few important theorems.

Specifically

- First I will explain the *overlap*, and the cutting operation in the presence of overlaps.

- Then I will give a complete proof to theorems concerning the algorithms **2CONNUP**. This algorithm is one of the three main algorithms of Deng-Hani-Ma.

- Then I will explain the relation between the algorithm **2CONNUP** and the whole framework of cutting algorithm. This will involve

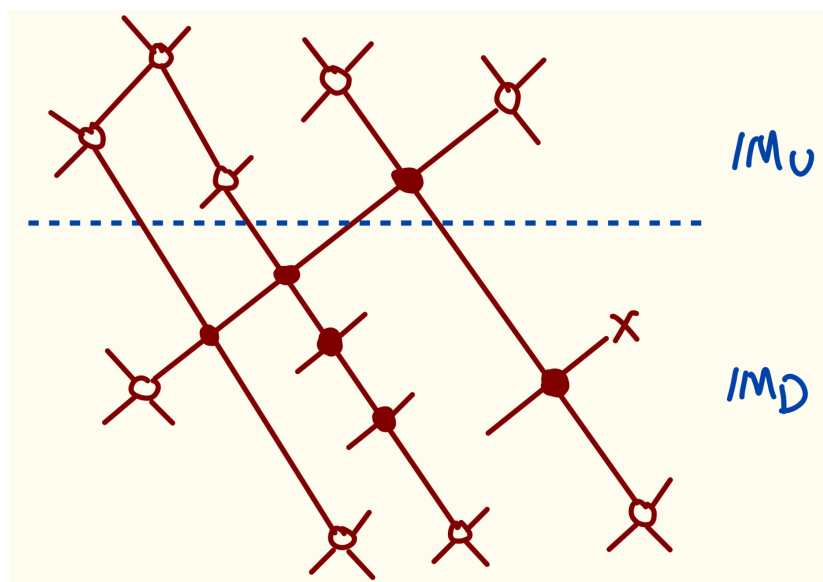 - Layer-refinement, layer-selection, degeneracy etc.

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Figure 1: A type of molecule we will encounter for algorithm **2CONNUP**.