On ch-diagrams with double points representing immersed surfaces in 4-space

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Any surface embedded in 4-space can be represented by a certain 4-valent plane graph having two kinds of vertices, which is called a ch-diagram. Using this diagram, K. Yoshikawa gave a method for enumerating all non-splittable and weakly prime embedded surfaces, and a table of such surfaces represented by diagrams the numbers of whose vertices are up to ten.

S. Kamada indicated that any surface immersed in 4-space having only transverse double points as its singularities can be represented by a certain 4-valent plane graph with three kinds of vertices, which is called a ch-diagram with double points. The speaker gave an analogous method to Yoshikawa's one for enumerating all non-splittable and weakly prime such immersed surfaces by ch-diagrams with double points, and a table of all such surfaces represented by such diagrams with up to five vertices and several surfaces done by ones with six vertices in his dissertation.

Unfortunately, the speaker however found one omission in the table (there may exist the other omissions), which is the knot sum of a standard projective plane and a standard immersed sphere. What to be noticed is that this surface is non-prime but weakly prime. (The index of a diagram is the number of its vertices, and that of a surface is the minimal number of indices among all diagrams representing the surface. A surface F is weakly prime if it can not be the knot sum of any two surfaces F_1, F_2 such that each index of them is less than that of F.) The speaker is now reconstructing such a table.

In this talk, he will review the method for enumerating such surfaces, and report the omission mentioned above.