

## Poster Presentation

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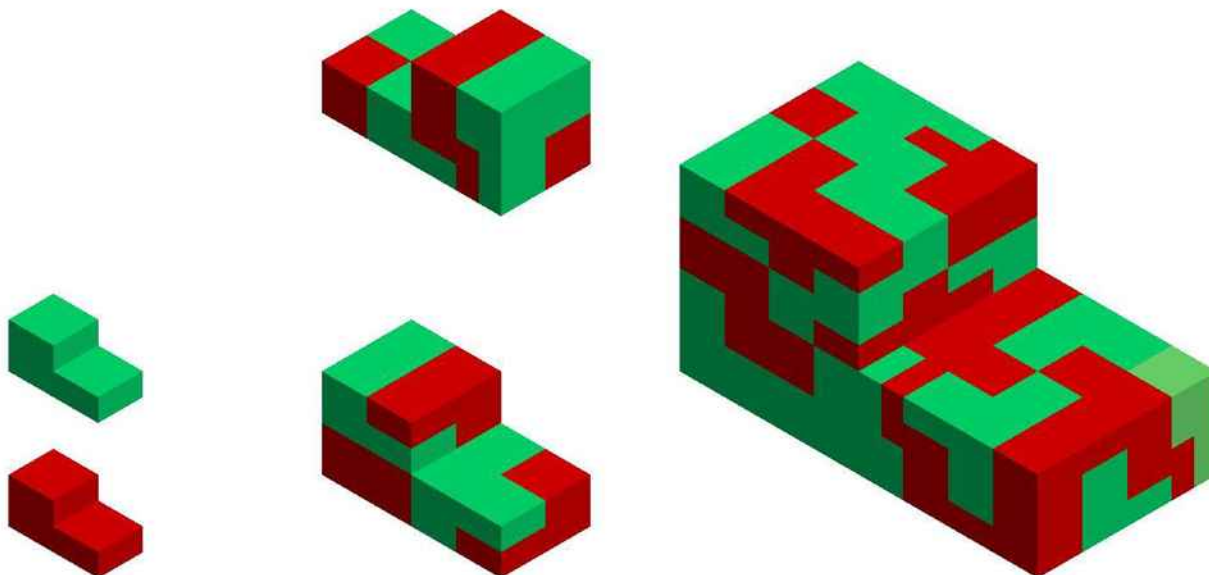
### *Aperiodic 3D tiling by self-similar substitution method using solid unit*

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There are two important aperiodic tiling methods. One is a projection method and the other is self-similar substitution method. Author applied projection and substitution method to several quasi-periodic tiling [1a] [1b] [1c] [2a] [2b] [2c]. Quantity of the information for research of aperiodic tiling except quasi-periodic tiling is not so large as that of quasi-periodic tiling. Author shows one of the substitution example. that is a "pentomino tile" which is made of five unit squares. First generation of a "pentomino tile" is composed of two original pentominos and chiral two original pentominos [3]. Author considered 3D solid body unit similar to exterior view of car-body as shown in figure, then succeeded in first generation tile using the body unit. In this study, author consider a relation between substitution and crystallographic rotation matrix and translation matrix and discuss general formulation of self-similar substitution. Caption of Figure: (left-hand) original generation, (center) First generation, (right-hand) Second generation

[1] (a) Watanabe, Y. Ito, M. & Soma, T. *Acta Cryst.* A43 (1986) 133-134; (b) Soma, T. & Watanabe, Y. *Acta Cryst.* A48 (1992) 470-475; (c) Watanabe, Y. *Material Science Forum* Voles 150-151(1994) 167-174, [2] (a) Watanabe, Y., Soma, T. & Ito, I. *Acta Cryst.* A51 (1995) 936-942; (b) Soma, T. & Watanabe, Y. *Acta Cryst.* A55 (1999) 508-511; (c) Watanabe, Y., Soma, T. & Ito, I. *Crystallography Reports*, Vol. 49, No. 4, 2004, 527-536, [3] [http://tilings.math.uni-bielefeld.de/people/j\\_pieniak](http://tilings.math.uni-bielefeld.de/people/j_pieniak)



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