

## FMfI2023 Poster Session

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Affiliation	Graduate School of Mathematics, Kyushu University, Fukuoka, Japan
Poster title	<b>On Connectivity of Solution to Integer Linear Systems</b>
Abstract	<p>An integer linear system (ILS) is a linear system with integer constraints. The solution graph of an ILS is defined as an undirected graph defined on the set of feasible solutions to the ILS. A pair of feasible solutions is connected by an edge in the solution graph if the Hamming distance between them is 1. We consider a property of the coefficient matrix of an ILS such that the solution graph is connected for any righthand side vector. Especially, we focus on the existence of an elimination ordering (EO) of a coefficient matrix, which is known as the sufficient condition for the connectedness of the solution graph for any right-hand side vector. That is, we consider the question whether the existence of an EO of the coefficient matrix is a necessary condition for the connectedness of the solution graph for any right-hand side vector. We first prove that if a coefficient matrix has at least four rows and at least three columns, then the existence of an EO may not be a necessary condition. Next, we prove that if a coefficient matrix has at most three rows or at most two columns, then the existence of an EO is a necessary condition.</p>
Short Bio	<p>Takasugu Shigenobu is currently a doctor course student at Graduate School of Mathematics, Kyushu University. He graduated from School of Mathematics and Physics, Kanazawa University in 2020, and then he finished the Master's Course in Mathematics, the Graduate School of Mathematics at Kyushu University, in 2022. His reasearch topics include the theory of discrete optimization. Especially, he is currently working on structures of the solution graph of an integer linear system.</p>