On inc-compatible monomial ordering on a polynomial ring in infinite many variables

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This work is about the analysis of term orders on polynomial rings with infinitely many variables. In our specific case, we index the variables with (i, j) for $i \in [c] = \{1, \ldots, c\}$ and $j \in N = \{1, 2, \ldots\}$. We study the relationship between classical monomial orders and the ones which satisfy the so called inc-compatibility condition. Among others, we show that we can construct from an arbitrary order an inc-compatible order. Moreover, the construction transforms a concretely given infinite set of monomial orders into an infinite set of inc-compatible monomial orders.

Keywords: monomial ordering, polynomial rings, in-compatible monomial ordering