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**Avoiding slack variables in the solving of linear diophantine equations and inequations.**

(English) [Zbl 0903.11033](#)

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Summary: The authors present an algorithm for solving directly linear diophantine systems of both equations and inequalities. Here directly means without adding slack variables for encoding inequalities as equalities. This algorithm is an extension of the algorithm due to *E. Contejean* and *H. Devie* [Inf. Comput. 113, 143-172 (1994; [Zbl 0809.11015](#))] for solving linear diophantine systems of equations, which is itself a generalization of the algorithm of Fortenbacher [*M. Clausen* and *A. Fortenbacher*, J. Symb. Comput. 8, No. 1/2, 201-216 (1989; [Zbl 0674.10011](#))] for solving a single linear diophantine equation. All the nice properties of the algorithm of Contejean and Devie are still satisfied by the new algorithm: it is complete, i.e. provides a (finite) description of the set of solutions, it can be implemented with a bounded stack, and it admits an incremental version. All of these characteristics enable its easy integration in the CLP paradigm.

**MSC:**

[11Y50](#) Computer solution of Diophantine equations  
[11D04](#) Linear Diophantine equations  
[68W30](#) Symbolic computation and algebraic computation  
[11D75](#) Diophantine inequalities  
[68N17](#) Logic programming  
[90C05](#) Linear programming

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linear diophantine systems of equations; algorithm; inequalities

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