

8th International Conference on Symmetries and Integrability of Difference  
Equations (SIDE8) **June 22–28, 2008**  
8<sup>e</sup> Conférence internationale “Symétrie et intégrabilité des équations aux  
différences” (SIDE8) **22–28 juin, 2008**

## Bäcklund transformation of Toda lattice and solution of Painlevé equation

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### **Abstract**

It is shown that the solutions of a one-dimensional Toda lattice and its Bäcklund transformation are simultaneously expressed in the form of Hankel determinant. An application of the determinant formula to solutions for Painlevé III equation of type  $D_7$  is also discussed.