On Darboux Integrability of semi-discrete hyperbolic type equations

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Abstract: We study a differential-difference equation of the form

$$t_x(n+1) = f(t(n), t(n+1), t_x(n))$$

with unknown $t = t(n,x)$ depending on x and n. The equation is called Darboux integrable if there exist functions F (called an x-integral) and I (called an n-integral), both of a finite number of variables $x, t(n), t(n+1), t(n+2), \ldots, t(n-1), t(n-2), \ldots, t_x(n), t_{xx}(n), \ldots$ such that $D_x F = 0$ and $DI = I$, where D_x is the operator of total differentiation with respect to x and D is the shift operator: $Dp(n) = p(n+1)$. The Darboux integrability property is reformulated in terms of characteristic Lie algebras that give an effective tool for classification of integrable equations.

Tea and coffee will be served at 15:00