LETTER TO THE EDITOR

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1966

SovietRxiv

Abstract

Full Text

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A NOTE ON K. S. SIBIRSKII' S ARTICLE "ON THE NUMBER OF LIMIT CYCLES IN A NEIGHBORHOOD OF A SINGULAR POINT"

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In article [3], in the note on p. 60, a critical remark is made concerning articles [1, 2]: "Let us note that in [1, 2] it was also unnecessary to compute $C_{02}(\tau)$, since the requirement that Θ_k^{xxx} contain the factor μ is equivalent to the requirement that the expansion of $\rho - \rho_0$ in powers of μ contain no terms below the second degree, and the latter is equivalent to the fulfillment of the equality $C_{01}(\tau) = 0$ independently of the choice of the curve C_{h0}."

This is incorrect. In fact, the requirement that Θ_k^{xxx} contain the factor μ is equivalent to the requirement that the expansion of $\rho-\rho_0$ in powers of μ contain no terms below the third degree, and the condition for this is the vanishing of $C_{02}(\tau)$ independently of the choice of the curve C_{h0}. The author of the note failed to observe that the parameter λ_4 in the expression for $\rho-\rho_0$, at the point of the parameter space under consideration that is proportional to μ, and therefore powers of μ in the expansion of $\rho - \rho_0$ are raised by one. All the difficulties of the proof in [1, 2] are connected precisely with this circumstance (the vanishing of $C_{01}(\tau)$ is obvious). In [3], owing to the structure of the conditions for a center, this specific complication does not arise, and for the proof it is sufficient to establish the identical vanishing of $C_{01}(\tau)$.

References

1. Bautin N. N. DAN SSSR, 24, No. 7, 668-671, 1939.
2. Bautin N. N. On the number of limit cycles arising under variation of coefficients from an equilibrium state of focus or center type. Mat. sb. 30, No. 1, 1952, pp. 181-196.
3. Sibirskii K. S. On the number of limit cycles in a neighborhood of a singular point. Differential Equations, No. 1, 53-66, 1965.

Note: Figure translations are in progress. See original paper for figures.