

ON THE MATHEMATICAL WORK OF LE VAN THIEM

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1. Born in 1918 in Ha Tinh, Vietnam, Le Van Thiem obtained his mathematical education in Paris (Ecole Normale Supérieure) and in Zürich. Under the guidance of G. Valiron he defended a Ph. D. Thesis entitled “*Sur un problème d’inversion dans la théorie des fonctions méromorphes*”. His thesis gave him an international recognition and a position as a professor at the University of Zürich.

After returned in Vietnam in 1949 and until the end of his life Le Van Thiem took charge of highest ranks in the education and development of mathematics in Vietnam. Most of Vietnamese mathematicians are his students, or students of his students.

2. In the 20’s the Nevanlinna inverse problem is formulated as follows.

Let (a_j) be a series of distinct points of the complex plane \mathbb{C} , and let (δ_j) and (θ_j) be series of non-negative numbers ($j < N$, $N < \infty$) satisfying the conditions:

$$0 < \delta_j + \theta_j \leq 1, \quad \sum (\delta_j + \theta_j) \leq 2.$$

Construct a meromorphic function f in \mathbb{C} such that $\delta(a_j, f) = \delta_j$, $\theta(a_j, f) = \theta_j$, $\forall j < N$, where by $\delta(a_j, f)$ (resp. $\theta(a_j, f)$) we denote the defect (the ramification indice, resp.) of f at the point a_j .

The first important solution is given by Nevanlinna himself in 1932 ([N]), in the case where $N < \infty$, δ_j are rationals, and $\sum \delta_j = 2$. Ten years later, Le Van Thiem ([2], [5]) has made a significant progress by solving the problem under the following hypothesis: $N < \infty$, δ_j and θ_j rationals, $\delta_j < 1$ if $\theta = 0$ and $\sum (\delta_j + \theta_j) = 2$. The importance of Le Van Thiem’s contribution lies first in his method. He has used successfully by the first time the quasiconformal mappings and the Teichmüller spaces. His idea was applied later in the papers of Goldberg ([G-O], Ch. 7), Drasin and Weitsman ([D-W]) and Drasin ([D]) who solved the inverse problem by giving a general and precise solution in 1977.

3. After many years concentrated on hard organisational works, Le Van Thiem returned to research in the years 60-70. The papers [7-9] are related to his previous papers, while the others ([6], [10-13]) are devoted to some problems in mechanics. He remarkably developed the methods of one variable complex analysis in fluid mechanics. His explicit solution of a problem of the filtration through a ground of two layers became classic ([6], [PK]).

MAIN PUBLICATIONS OF LE VAN THIEM

- [1] *Beitrag zum Typenproblem der Riemannschen Flächen*, Comment. Math. Helv. **20** (1947).
- [2] *Über das Umkehrproblem der Werterteilungslehre*, Ibid. **23** (1949).
- [3] *Le degré de ramification d'une surface de Riemann et la croissance de la caractéristique de la fonction uniformisante*, C. R. Acad. Sc. Paris **228** (1949).
- [4] *Un problème de type généralisé*, Ibid. **228** (1949).
- [5] *Sur un problème d'inversion dans la théorie des fonctions méromorphes*, Ann. Sci. Ecole Normale Sup. **67** (1950), 51-98.
- [6] *Sur un problème d'infiltration à travers un sol à deux couches*, Acta Sci. Vietnam., Sectio Sci. Math. et Phys. **1** (1964), 3-9.
- [7] *Sur un type de surfaces déterminées par un groupe de substitutions linéaires*, Siber. Mat. J. **5**, n. 4 (1964), (in Russian).
- [8] *Sur l'existence d'un potentiel automorphe borné*, Acta Sci. Vietnam., Sectio Sci. Math. et Phys. **2** (1965), 1-4.
- [9] *Sur l'existence d'une fonction harmonique automorphe bornée*, Ibid. **7** (1972), 5-15.
- [10] (avec Ngo Van Luoc et Le Van Thanh) *Un problème d'infiltration posé par le désalement*, Revue de Math. et Phys. **2**, n. 2 (1966), 23-26 (in Vietnamese).
- [11] (avec Hoang Dinh Dung et Ngo Van Luoc) *Les fonctions p -analytiques et le mouvement des liquides visqueux à symétrie axiale*, Acta Sci. Vietnam., Sectio Sci. Math. et Phys. 9-10 (1979), 24-33.
- [12] (avec....) *Quelques problèmes mathématiques posés par le mouvement des eaux filtrantes*, Publications of the Ho Chi Minh City University, 1978 (in Vietnamese).
- [13] *Quelques méthodes mathématiques dans la théorie de l'élasticité*, Ibid. (1979) (in Vietnamese).

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- [D-W] D. Drasin and A. Weitsman, *Meromorphic functions with large sums of deficiencies*, Advances in Math. **15** (1974), 93-126.
- [G-I] A. A. Goldberg and I. V. Ostrovskii, *Value Distribution of Meromorphic Functions*, Nauka, Moscow, 1970 (in Russian).
- [N] R. Nevanlinna, *Über Riemannschen Flächen mit endlich vielen Windungspunkten*, Acta Math. **58** (1932), 298-375.
- [PK] P. Ya. Palubarinova-Kochina, *Théorie du Mouvement des Eaux Souterraines*, Nauka, Moscow, 1977 (in Russian).