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RECTORATUL

Universitatea Babeş-Bolyai Competiția Excelenței 2010

Dosar individual

Notă: Toate datele se referă la perioada 2005-2009

Nume, prenume, grad did.	BARICZ ÁRPÁD
Facultatea, Catedra	Facultatea de Științe Economice și Gestiunea Afacerilor, Catedra de Administrarea Afacerilor, Extensiunea Sfintu-Gheorghe
Domeniul științific	Matematică
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Adresa e-mail	bariczocsi@yahoo.com

Criteriaul I – Output

1. Articole științifice publicate în reviste indexate ISI (cu factorul de impact)

1. Árpád Baricz, Functional inequalities involving special functions, *Journal of Mathematical Analysis and Applications*, 319(2) (2006), 450-459. [doi:10.1016/j.jmaa.2005.06.052](https://doi.org/10.1016/j.jmaa.2005.06.052) (IF: 0.764)
2. Árpád Baricz, Functional inequalities involving special functions II, *Journal of Mathematical Analysis and Applications*, 327(2) (2007), 1202-1213. [doi:10.1016/j.jmaa.2006.05.006](https://doi.org/10.1016/j.jmaa.2006.05.006) (IF: 0.872)
3. Árpád Baricz, Edward Neuman, Inequalities involving modified Bessel functions of the first kind II, *Journal of Mathematical Analysis and Applications*, 332(1) (2007), 265-271. [doi:10.1016/j.jmaa.2006.10.007](https://doi.org/10.1016/j.jmaa.2006.10.007) (IF: 0.872)
4. Árpád Baricz, Turán type inequalities for generalized complete elliptic integrals, *Mathematische Zeitschrift*, 256(4) (2007), 895-911. [doi:10.1007/s00209-007-0111-x](https://doi.org/10.1007/s00209-007-0111-x) (IF: 0.680)
5. Árpád Baricz, Some inequalities involving generalized Bessel functions, *Mathematical Inequalities and Applications*, 10(4) (2007), 827-842. (IF: 0.312)
6. Árpád Baricz, Ling Zhu, Extension of Oppenheim's problem to Bessel functions, *Journal of Inequalities and Applications*, 2007 (2007), Art. 82038. [doi:10.1155/2007/82038](https://doi.org/10.1155/2007/82038) (IF: 0.408)
7. Árpád Baricz, Mills' ratio: Monotonicity patterns and functional inequalities, *Journal of Mathematical Analysis and Applications*, 340(2) (2008), 1362-1370. [doi:10.1016/j.jmaa.2007.09.063](https://doi.org/10.1016/j.jmaa.2007.09.063) (IF: 1.046)
8. Árpád Baricz, Turán type inequalities for hypergeometric functions. *Proceedings of the American Mathematical Society*, 136 (9) (2008), 3223-3229. [doi:10.1090/S0002-9939-08-09353-2](https://doi.org/10.1090/S0002-9939-08-09353-2) (IF: 0.584)
9. Szilárd András, Árpád Baricz, Properties of the probability density function of the non-central chi-squared distribution. *Journal of Mathematical Analysis and Applications*, 346(2) (2008), 395-402. [doi:10.1016/j.jmaa.2008.05.074](https://doi.org/10.1016/j.jmaa.2008.05.074) (IF: 1.046)
10. Árpád Baricz, Geometric properties of generalized Bessel functions, *Publicationes Mathematicae Debrecen*, 73 (1-2) (2008), 155-178. (IF: 0.346)
11. Árpád Baricz, Functional inequalities involving Bessel and modified Bessel functions of the first kind, *Expositiones Mathematicae*, 26(3) (2008), 279-293. [doi:10.1016/j.exmath.2008.01.001](https://doi.org/10.1016/j.exmath.2008.01.001) (IF: 0.568)

12. Yin Sun, Árpád Baricz, Inequalities for the generalized Marcum Q-function, *Applied Mathematics and Computation*, 203(1) (2008), 134-141. [doi:10.1016/j.amc.2008.04.009](https://doi.org/10.1016/j.amc.2008.04.009) (IF: 0.961)
13. Árpád Baricz, On a product of modified Bessel functions. *Proceedings of the American Mathematical Society*, 137 (1) (2009), 189-193. [doi:10.1090/S0002-9939-08-09571-3](https://doi.org/10.1090/S0002-9939-08-09571-3) (IF: 0.584)
14. Árpád Baricz, Shanhe Wu, Sharp Jordan-type inequalities for Bessel functions, *Publicationes Mathematicae Debrecen*, 74 (1-2) (2009), 107-126. (IF: 0.346)
15. Árpád Baricz, Shanhe Wu, Sharp exponential Redheffer-type inequalities for Bessel functions, *Publicationes Mathematicae Debrecen*, 74 (3-4) (2009), 257-278. (IF: 0.346)
16. Árpád Baricz, Yin Sun, New bounds for the generalized Marcum Q-function, *IEEE Transactions on Information Theory*, 55(7) (2009), 3091-3100. [doi:10.1109/TIT.2009.2021370](https://doi.org/10.1109/TIT.2009.2021370) (IF: 3.793)
17. Árpád Baricz, Tight bounds for the generalized Marcum Q-function. *Journal of Mathematical Analysis and Applications*, 360(1) (2009), 265-277. [doi:10.1016/j.jmaa.2009.06.055](https://doi.org/10.1016/j.jmaa.2009.06.055) (IF: 1.046)
18. Shanhe Wu, Árpád Baricz, Generalizations of Mitrinovic, Adamovic and Lazarevic's inequalities and their applications, *Publicationes Mathematicae Debrecen*, 75 (3-4) (2009), 447-458. (IF: 0.346)
19. Yin Sun, Árpád Baricz, Ming Zhao, Xibin Xu, Shidong Zhou, Approximate average bit error probability for DQPSK over fading channels, *Electronics Letters*, 45(23) (2009), 1177-1179. [doi:10.1049/el.2009.2467](https://doi.org/10.1049/el.2009.2467) (IF: 1.140)

3. Articole științifice indexate în BDI (din lista CNCSIS)

[Mathematical Reviews, Zentralblatt Math, Scopus]

1. Árpád Baricz, A subclass of starlike functions, *Mathematica*, 47(70)(1) (2005), 19-25.
2. Árpád Baricz, Univalent functions in simply connected domains, *Libertas Mathematica*, (25) (2005), 97-103.
3. Árpád Baricz, Landen-type inequality for Bessel functions, *Computational Methods and Function Theory*, 5(2) (2005), 373-379. <http://www.heldermann.de/CMF/CMF05/CMF052/cmf05022.htm>
4. Árpád Baricz, Edward Neuman, Inequalities involving generalized Bessel functions, *Journal of Inequalities in Pure and Applied Mathematics*, 6(4) (2005), Art. 126. <http://jipam.vu.edu.au/article.php?sid=600>
5. Árpád Baricz, Geometric properties of generalized Bessel functions of complex order, *Mathematica*, 48(71)(1) (2006), 13-18.
6. Árpád Baricz, Bessel transforms and Hardy space of generalized Bessel functions, *Mathematica*, 48(71)(2) (2006), 127-136.
7. Árpád Baricz, Grünbaum-type inequalities for special functions, *Journal of Inequalities in Pure and Applied Mathematics*, 7(5) (2006), Art. 175. <http://jipam.vu.edu.au/article.php?sid=793>
8. Árpád Baricz, Redheffer type inequality for Bessel functions, *Journal of Inequalities in Pure and Applied Mathematics*, 8(1) (2007), Art. 11. <http://jipam.vu.edu.au/article.php?sid=824>
9. Árpád Baricz, Convexity of the zero-balanced Gaussian hypergeometric functions with respect to Hölder means, *Journal of Inequalities in Pure and Applied Mathematics*, 8(2) (2007), Art. 40. <http://jipam.vu.edu.au/article.php?sid=847>
10. Árpád Baricz, Functional inequalities for Galué's generalized modified Bessel functions, *Journal of Mathematical Inequalities*, 1(2) (2007), 183-193.
11. Árpád Baricz, A functional inequality for the survival function of the gamma distribution, *Journal of Inequalities in Pure and Applied Mathematics*, 9(1) (2008), Art. 13. <http://jipam.vu.edu.au/article.php?sid=937>
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13. Árpád Baricz, József Sándor, Extensions of the generalized Wilker inequality to Bessel functions, *Journal of Mathematical Inequalities*, 3(2) (2008), 397-406.
14. Szilárd András, Árpád Baricz, Monotonicity property of generalized and normalized Bessel functions of complex order, *Complex Variables and Elliptic Equations*, 54(7) (2009), 689-696. [doi:10.1080/17476930902998936](https://doi.org/10.1080/17476930902998936)

6. Cărți științifice publicate în edituri naționale acreditate

1. András Szilárd, Baricz Árpád, *Statistică pentru economiști*, Editura Státus, Miercurea-Ciuc, 2007, 300 p.

Criteriul II – Prestigiu profesional

1. Citări ale articolelor ISI listate la Criteriul I în reviste cotate ISI (24 de citări)

ISI1. Árpád Baricz, Functional inequalities involving special functions, *Journal of Mathematical Analysis and Applications*, 319(2) (2006), 450-459. [doi:10.1016/j.jmaa.2005.06.052](https://doi.org/10.1016/j.jmaa.2005.06.052) (IF: 0.764)

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- D. Karp, S.M. Sitnik: Inequalities and monotonicity of ratios for generalized hypergeometric function. *Journal of Approximation Theory* 161(1) (2009) 337-352.
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- X. Zhang, G. Wang, Y. Chu: Convexity with respect to Hölder mean involving zero-balanced hypergeometric functions. *Journal of Mathematical Analysis and Applications* 353(1) (2009) 256-259.
- F. Qi, D.-W. Niu, B.-N. Guo: Refinements, generalizations and applications of Jordan's inequality and related problems. *Journal of Inequalities and Applications* 2009 (2009) Art. 271923. <http://www.hindawi.com/journals/jia/2009/271923.abs.html>
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ISI12. Yin Sun, Árpád Baricz, Inequalities for the generalized Marcum Q-function, *Applied Mathematics and Computation*, 203(1) (2008), 134-141. [doi:10.1016/j.amc.2008.04.009](https://doi.org/10.1016/j.amc.2008.04.009) (IF: 0.961)

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ISI15. Árpád Baricz, Shanhe Wu, Sharp exponential Redheffer-type inequalities for Bessel functions, *Publicationes Mathematicae Debrecen*, 74 (3-4) (2009), 257-278. (IF: 0.346)

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ISI16. Árpád Baricz, Yin Sun, New bounds for the generalized Marcum Q-function, *IEEE Transactions on Information Theory*, 55(7) (2009), 3091-3100. [doi:10.1109/TIT.2009.2021370](https://doi.org/10.1109/TIT.2009.2021370) (IF: 3.793)

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2. Alte citări ale lucrărilor listate mai sus (47 de citări)

ISI1. Árpád Baricz, Functional inequalities involving special functions, *Journal of Mathematical Analysis and Applications*, 319(2) (2006), 450-459. [doi:10.1016/j.jmaa.2005.06.052](https://doi.org/10.1016/j.jmaa.2005.06.052) (IF: 0.764)

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- D. Hammarwall: Resource Allocation in Multi-Antenna Communication Systems with Limited Feedback. Doctoral Thesis in Telecommunications, Stockholm, Sweden, 2007.
- V. Heikkala, M.K. Vamanamurthy, M. Vuorinen: Generalized elliptic integrals. *Computational Methods and Function Theory* 9(1) (2009) 75-109.
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- F. Qi, S. Guo, B.N. Guo: A Class of k -log-convex functions and their applications to some special functions. *RGMA Research Report Collection* 10(1) (2007) Art. 21. <http://rgmia.vu.edu.au/v10n1.html>
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- F. Qi: Bounds for the ratio of two gamma functions. *RGMA Research Report Collection* 11(3) (2008) Art. 1, pp. 67 [electronic].

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10. Participări la programe/granturi finanțate din sursă națională (se menționează și valoarea)

1. Grant CNCSIS 348/2005 (2005, 2006), Titlu: *Metode geometrice în teoria funcțiilor reale și complexe. Aplicații*, director proiect: Prof. dr. Grigore Șt. Sălăgean.
2. Grant CEEX, modul 3, nr. 130/2006 (2006, 2007), Titlu: *Dezvoltarea unor parteneriate de cercetare în vederea integrării europene a cercetării matematice de vârf românești în domeniile analizei neliniare, topologiei diferențiale și ale aplicațiilor acestora*, director proiect: Prof. dr. Varga Csaba.
3. Grant CNCSIS de tip A, nr. 1472/2007 (2007, 2008), Titlu: *Probleme moderne în teoria geometrică a funcțiilor de o variabilă și de mai multe variabile. Aplicații*, director proiect: Prof. dr. Gabriela Kohr.

III. Realizare remarcabilă

(Descrieți într-o manieră cât mai accesibilă (în maximum 1 pagină) cea mai importantă realizare științifică/tehnică/artistică din ultimii 5 ani și impactul acesteia.)

Aplicarea funcțiilor speciale în teoria informației

Cu inginerul **Yin Sun** (Tsinghua University, Beijing, China) în articolul ISI [12] am prezentat o conjectură pentru funcția generalizată Marcum: această funcție nu numai satisface o inegalitate de tip Turán, ci este logaritmically concavă în raport cu ordinea funcției. Acest rezultat poate fi aplicat în studiul marginilor inferioare și superioare. Anumite rezultate recente justifică conjectura din articolul ISI [12], prezentarea inginerilor **Yin Sun și Shidong Zhou** (Tsinghua University, Beijing, China) în 2008 la conferința IEEE GLOBECOM (Global Communications Conference) a ținut seamă de mare interes (a se vedea Y. Sun and S. Zhou, Tight bounds of the generalized Marcum Q-function based on log-concavity, in *Proceedings of the IEEE Global Communications Conference (Globecom)*, New Orleans, LA, USA, Nov. 2008, pp. 1-5). Mai mult, recent împreună cu inginerii Yin Sun și Shidong Zhou am reușit să demonstrăm parțial conjectura menționată mai sus. A se vedea lucrarea

Yin Sun, Árpád Baricz, Shidong Zhou, On the monotonicity, log-concavity and tight bounds of the generalized Marcum and Nuttall Q-functions, *IEEE Transactions on Information Theory* (sub tipar). (IF: 3.793)

În studiul funcției generalizate Marcum o altă metodă este aplicarea monotonității și convexității a anumitor funcții care sunt construite cu ajutorul funcției modificate Bessel de prima speță. În lucrările ISI [16] și [17] cu inginerul Yin Sun am aplicat cu succes anumite rezultate din teoria funcțiilor speciale obținând astfel margini inferioare și superioare foarte bune pentru funcția generalizată Marcum. Aceste rezultate sunt foarte importante în domeniu pentru că funcția generalizată Marcum este greu de aproximat pentru indici neîntregi. Mai mult, am aplicat aceste rezultate cu succes la studiul semnalelor de radar: în lucrarea ISI [19] am dat o aproximare foarte precisă pentru rata de eroare bit.

Data: 10.03.2010

Semnătura: **Baricz Árpád**

Certific validitatea datelor prezentate

Sef de catedră,

Prof.univ.dr. FAZAKAS Jozsef