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Zoom lenses for professional cinema 17

***Abstract:***

***Some optical schemes of zoom lenses applied in professional cinematography are considered.***

***Comparison of some consumer characteristics of the zoom lens various architecture is carried out. Examples of optical systems calculation applied to various problems of cinematography are given. Practical recommendations about development and use of zoom lenses are given.***

***References:***

***1. Milton Laikin,* “Lens Design”, Fourth Edition, CRC Press 2006.**

***2. Ono, I., Kobayashi, S., Yoshida, K*.: Optimal lens design by real-coded genetic algorithms using UNDX. In: Computer methods in applied mechanics and engineering, pp. 438–497 (2000).**

***3. Nagata Y.* (2004) The Lens Design Using the CMA-ES Algorithm. In: Deb K. (eds) Genetic and Evolutionary Computation – GECCO 2004. GECCO 2004. Lecture Notes in Computer Science, vol 3103. Springer, Berlin, Heidelberg.**

***4. Julie Beaulieu, Christian Gagn´e, Marc Parizeau, Lens* System Design and Re-Engineering with Evolutionary Algorithms // Proc. of GECC0 2002, July 9-13, New York.**

***5. M. van Turnhout, P. van Grol, F. Bociort, and H. P. Urbach,* Obtaining new local minima in lens design by constructing saddle points, Opt. Express 23, 6679- 6691 (2015).**

***6. Biryuchinskiy S.* Modeling and optimization of optical systems architecture for a modern cinema // Mir Tehniki Kino. - 2015. - № 37. - p. 8 - 12.**

**7. USA patent US 9,594,234 B2, 2017.**

**8. USA patent US 9,557,541 B2 2017.**

**9. USA patent US 9,523,843 B2 2016.**

**10.www.optica-elite.com.**

**11. www.zeiss.com/cine.**

**12. www.angenieux.com**

**13. olympusimage.com.sg**

**14. www.TokinaCinema.com**