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Optimized probabilistic quantum processors: A unified geometric approach\kerning1 JANOS BERGOU, CUNY Hunter College, EMILIO BAGAN, Fisica Teorica: Informacio i Fenomens Quantics, Universitat Autonoma de Barcelona, EDGAR FELDMAN, Department of Mathematics, Graduate Center of the City University of New York — Using probabilistic [1] and deterministic quantum cloning [2], and quantum state separation [3] as illustrative examples we develop a complete geometric solution for finding their optimal success probabilities. The method is related to the approach that we introduced earlier for the unambiguous discrimination of more than two states [4]. In some cases the method delivers analytical results, in others it leads to intuitive and straightforward numerical solutions. We also present implementations of the schemes based on linear optics employing few-photon interferometry.\pard[1] V. Yerokhin, A. Shehu, E. Feldman, E. Bagan, and J. Bergou, Probabilistically perfect cloning, submitted to PRL (2015).2] V. Yerokhin, A. Shehu, E. Bagan, E. Feldman, and J. Bergou, Approximate probabilistic cloning, in preparation.3] V. Yerokhin, A. Shehu, E. Feldman, E. Bagan, and J. Bergou, A geometric approach to state separation, submitted to NJP (2015).\pard[4] J. Bergou, U. Futschik, and E. Feldman, Optimal unambiguous discrimination of pure quantum states, Phys. Rev. Lett. **108**, 250502 (2012).

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