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Nota di contenuto	Front matter -- Table of contents -- Chapter 1. Introduction and statements of the results -- Chapter 2. The Alexander series of a link in a rational homology sphere and some of its properties -- Chapter 3. Invariance of the surgery formula under a twist homeomorphism -- Chapter 4. The formula for surgeries starting from rational homology spheres -- Chapter 5. The invariant A. for 3-manifolds with nonzero rank -- Chapter 6. Applications and variants of the surgery formula -- Appendix. More about the Alexander series -- Bibliography -- Index
Sommario/riassunto	This book presents a new result in 3-dimensional topology. It is well known that any closed oriented 3-manifold can be obtained by surgery on a framed link in S 3. In Global Surgery Formula for the Casson-Walker Invariant, a function F of framed links in S 3 is described, and it is proven that F consistently defines an invariant, lamda (l), of closed oriented 3-manifolds. l is then expressed in terms of previously known invariants of 3-manifolds. For integral homology spheres, l is the invariant introduced by Casson in 1985, which allowed him to solve old and famous questions in 3-dimensional topology. l becomes simpler as the first Betti number increases. As an explicit function of Alexander polynomials and surgery coefficients of framed links, the function F extends in a natural way to framed links in rational homology spheres.

It is proven that F describes the variation of l under any surgery starting from a rational homology sphere. Thus F yields a global surgery formula for the Casson invariant.