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CO-ABSOLUTES OF REMAINDERS OF STONE-CECH COMPACTIFICATIONS

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Let X be a completely regular Hausdorff space. Denote the "absolute" (also called the "projective cover") of X by $E(X)$, the Boolean algebra of regular closed subsets of X by $R(X)$, and the Stone-Cech compactification of X by βX. In this paper it is proved that the canonical map $k: E(\beta X) \to \beta X$ maps $\beta E(X) - E(X)$ irreducibly onto $\beta X - X$ if and only if the map $A \to cl_{\beta X} A - X$ is a Boolean algebra homomorphism from $R(X)$ into $R(\beta X - X)$. This latter condition is shown to hold for a wide class of spaces X. These results are used to calculate absolutes and well-known co-absolutes of $\beta X - X$ under several different sets of hypotheses concerning the topology of X.

Throughout this paper we use without further comment the notation and terminology of the Gillman-Jerison text [6]. In particular, the cardinality of a set S is denoted by $|S|$. The countable discrete space is denoted by N, and the set of nonnegative integers (used as an index set) is denoted by N. The symbol $[CH]$ appearing before the statement of a theorem indicates that the continuum hypothesis ($\aleph_1 = 2^{\aleph_0}$) is used in the proof of the theorem. The cardinal $2^{\aleph_0}$ will be denoted by the letter c. All topological spaces considered in this paper are assumed to be completely regular Hausdorff spaces. This assumption is repeated for emphasis from time to time.

In § 1 we give a brief summary of known results and define some notation and terminology. Some of the results in later sections are generalizations of results appearing in [17]. Background material on Boolean algebras appears in [15].

1. Preliminaries. The concept of the absolute of a topological space has been considered by several authors, notably Gleason [7], Iliadis [8], Flachsmeyer [5], Ponomarev [12], and Strauss [16]. In the first part of this section we give a brief outline of this theory. Although a theory of absolutes can be developed for a wider class of topological spaces, we shall assume that all spaces considered are completely regular and Hausdorff.

Recall that a subset A of a topological space X is said to be *regular closed* if $A = cl_X(\text{int}_X A)$. Let $R(X)$ denote the family of all regular closed subsets of X. The following theorem is well-known; see, for example, § 1 and § 20 of [15].