Preface

The study of variable stars is one of the most popular and dynamic fields of modern astronomical research. There are a number of variable stars in case of which their variability has not been confirmed. Moreover there are a large number of stars in case of which the variation has been established but they are not classified for want of some more observational data about their variability. The variation of stars depends upon various factors like mass, composition and stage of evolution. In case of binary stars the variability of these stars helps in understanding a mechanism of stellar evolution. Hence this study is very much significant.

The study of variation of the stars mainly involves the photometric measurement of the luminosity of such stars. The photometric work is done mostly by using a solid state photoelectric photometer or a charge coupled device (CCD) as a backend instrument along with a computer controlled small telescope. By using these instruments observations of variable star are taken for several hours over a period required to study the variability. There exist a variety of bright stars that need continuous, systematic observation over a long time span to determine their short-term and long term variation and unusual stellar activity and for this kind of work small telescope is a natural choice. Small telescopes are contributing significantly to this type of studies because it is difficult to get a time slot for this purpose on large telescope. This study of variable star is found to be useful in the survey of many stars or in the measurement of variability for single star.

The thesis is aimed at providing better understanding of the photometric light variation of chromospherically active stars. The chromospherically active stars display appreciable changes in their light curves within very short period of time typically covering
a couple of rotation periods. The light curves of these stars obtained during any two seasons do not agree in shape, amplitude, and phase of light minimum and maximum and mean light level. Hence, monitoring these objects for longer time-span is required in order to understand their peculiar behavior.

**Chapter 1** briefly reviews general properties of chromospherically active stars that include RS CVn binaries. General properties of these stars are summarized and techniques currently in use to explore these properties are discussed.

**Chapter 2** describes detail of photometric observations as well as reduction strategies adopted for this work. All the photometric data analyzed in this thesis were obtained using small telescopes; 12” Meade LX200 Schmidt-Cassegrain reflector telescope mounted on the building J.E.S. College, Jalna, India. In order to investigate local sky condition for valuable astronomical observations, I obtained values of atmospheric extinction coefficients in BV passband. I also carried out observations for calibration of telescope detector system and checked the reliability of the system calibration. In order to investigate the variability of program stars differential photometric techniques were used. The differential photometric observations of six prominent RS CVn binaries, a well-known class of chromospherically active stars were carried out during 2006-2007 observing seasons.

**Chapter 3** presents the variation of six RS CVn binaries of chromospherically active stars. The BV optical photometry of these stars carried out during 2006-2007 is reported.

**Chapter 4** deals with the discussion of the photometric observations of RS CVn binaries of chromospherically active stars.

**Chapter 5** is the Results and Conclusions inferred from the data.