STUDY OF THE RESOLVED RADIO SUPERNOVA SN2008IZ IN M82

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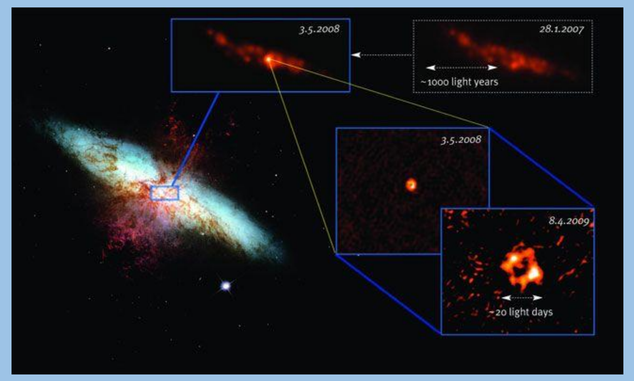
INTRODUCTION

i. Core-collapse Supernovace (CCSne) result from the explosive deaths of massive stars
ii. SN 2008iz in M82 was discovered as a radio Supernova in 2008
iii. High-resolution VLBl shows an expanding shell with deceleration
iv. Interaction with the circumstellar medium produces sychrotron radio emission



The left image, taken with the HST , shows the body of M82 in blue and hydrogen gas breaking out from the central starburst in red. The VLA image (top left) clearly shows the supernova (SN 2008iz), taken in May 2008. The high-resolution VLBI images (lower right) shows an expanding shell at the scale of a few light days and proves the transient source as the result of a supernova explosion in M82.

RESEARCH OBJECTIVES

- To generate multi-epoch radio intensity maps of SN2008iz using calibrated interferometric data in order to characterize the spatial morphology and evolution of the expanding radio shell.
- To construct spectral index maps (α) from dual-frequency radio images to measure spatial variations in synchrotron emission and determine the distribution of relativistic electrons and magnetic fields.
- To quantify the interaction between the expanding ejecta and the circumstellar medium by analyzing spatial variations in intensity and spectral index across the supernova shell

METHODOLOGY

Data:

- Archival data from the Very Long Baseline Interferometry (VLBI)

Processing:

- Calibration using AIPS software.
- Imaging to reconstruct radio maps.
- Flux measurements used to create spectral index maps.

RATIONALE FOR STUDY

❖Previous studies examined expansion dynamics and radio light curves.
❖Detailed spatial and spectral index diagnostics remain limited.
❖Radio intensity maps reveal shell structure and brightness asymmetries.
❖Spectral index maps help study synchrotron emission and absorption processes.

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