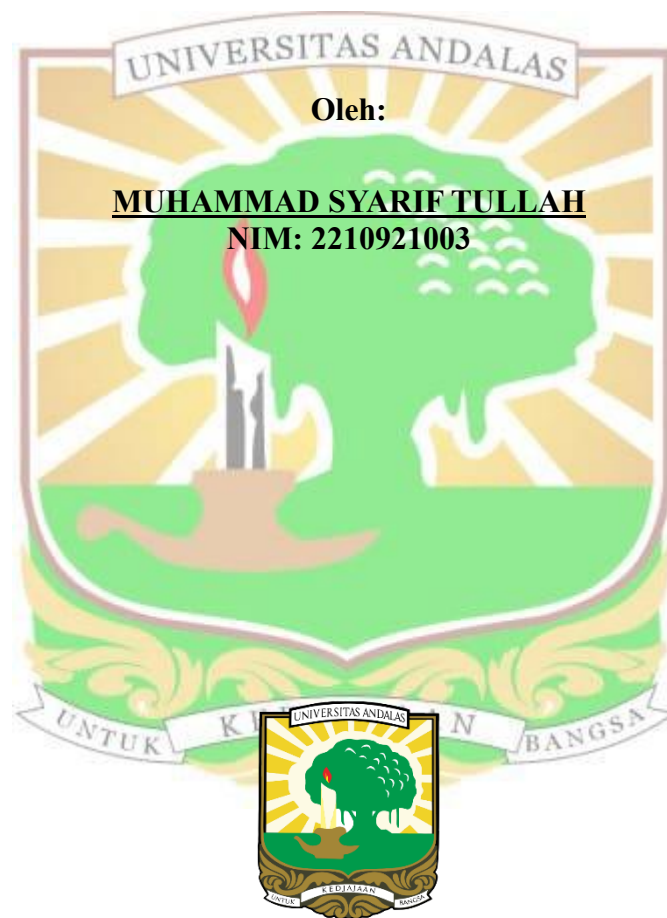


**ANALISIS DISTRIBUSI REGANGAN PADA BALOK BETON  
BERTULANG DOMINAN GESER DENGAN METODE  
*DIGITAL IMAGE CORRELATION***

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**PADANG  
2026**

## ABSTRAK

*Analisis distribusi regangan pada elemen struktur beton bertulang, merupakan aspek penting dalam memahami mekanisme perilaku dan keruntuhan geser. Penelitian ini bertujuan untuk menganalisis dan membandingkan distribusi regangan pada penampang balok beton bertulang dengan rasio bentang geser terhadap tinggi efektif balok ( $a/d$ ) sebesar 1,85. Metode yang digunakan meliputi pengujian eksperimental menggunakan metode non-kontak Digital Image Correlation (DIC) serta analisis numerik menggunakan perangkat lunak Reinforced Concrete Cross Section Analysis (RCCSA). Benda uji berupa 9 balok beton bertulang dengan panjang 1800 mm, lebar 125 mm dan tinggi 300 mm diuji dengan pembebanan monotonik hingga runtuh. Selama pengujian, kamera beresolusi tinggi merekam perubahan pola bintik (speckle pattern) pada permukaan balok, yang selanjutnya dianalisis menggunakan perangkat lunak DIC untuk memperoleh peta distribusi regangan. Secara paralel, model numerik yang merepresentasikan kondisi benda uji dianalisis menggunakan RCCSA untuk memperoleh distribusi regangan teoritis. Hasil penelitian menunjukkan perbandingan nilai regangan beton tekan pada serat atas dan baja tulangan tarik tarik pada serat bawah hasil metode DIC sangat dekat dengan hasil RCCSA. Hasil ini juga menunjukkan metode DIC yang digunakan pada penelitian ini tepat dan hasilnya akurat.*

**Kata kunci :** Keruntuhan Geser, Digital Image Correlation (DIC), RCCSA, Analisis Regangan dan Balok.

## ABSTRACT

*The analysis of strain distribution in reinforced concrete structural elements is a crucial aspect in understanding the behavioral mechanisms and shear failure characteristics. This study aims to analyze and compare the strain distribution in reinforced concrete beam sections with a shear span-to-effective depth ratio ( $a/d$ ) of 1.85. The methodology employed includes experimental testing using a non-contact Digital Image Correlation (DIC) technique and numerical analysis using Reinforced Concrete Cross Section Analysis (RCCSA) software. The test specimens consisted of nine reinforced concrete beams with a length of 1800 mm, a width of 125 mm, and a height of 300 mm, subjected to monotonic loading until failure. During the testing process, a high-resolution camera was used to capture the changes in speckle patterns on the beam surface, which were subsequently analyzed using DIC software to obtain strain distribution maps. In parallel, a numerical model representing the test conditions was analyzed using RCCSA to determine the theoretical strain distribution. The results indicate that the strain values of compressive concrete at the top fiber and tensile reinforcement at the bottom fiber obtained from the DIC method are in close agreement with those obtained from RCCSA. These findings demonstrate that the DIC method employed in this study is appropriate and provides accurate results.*

**Keywords:** Shear Failure, Digital Image Correlation (DIC), Reinforced Concrete Cross Section Analysis (RCCSA), Strain Analysis and Beam.

