1. Introduction

A hygro-mechanical approach proposed by [1] was used to model the corrosion induced cracking in a reinforced concrete specimen. In this approach, a transport and a mechanical lattice model were coupled in order to model the penetration of corrosion products into the specimen as well as the corrosion induced cracks.

2. Method

The analyses were carried out using the finite element mesh generated by [1]. Rust product was assumed to be a fluid and it is able to transport into the concrete pores. The test was repeated with different values of expansion coefficient, viscosity, load step number and compared with different specimen.

3. Analysis Results

The analysis below is the influence of expansion coefficient which only involves the mechanical model and therefore the transport model is neglected. The expansive layer is calculated using the approach by [2]. It is obvious that as this coefficient increases, the crack widths become larger.

The graph below is the comparison between the mechanical only test and the coupled test with a high viscosity value. Theoretically both curves should be identical. The sudden jump on the blue curve can be due to numerical error.

The analysis below is the influence of viscosity which is coupled model test. It can be seen that as the viscosity increases the crack widths become larger.

4. References
