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MULTIVARIATE UNIT AND GROUP RUNS CONTROL CHART TO DETECT SHIFTS IN THE MEAN VECTOR

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ABSTRACT: In some production processes, observations related to the quality characteristics of the process are independent. Under this set up, we propose the 'Multivariate Unit and Group Runs control chart for mean vector' (MV-UGR-M). It is verified that, the MV-UGR-M gives a significant reduction in the out-of-control 'Average Time to Signal' (ATS) in the zero state, as well in the steady state as compared to the 'Multivariate Synthetic control chart for Mean vector' (MV-Syn-M) chart, the 'Multivariate Group Runs control chart for Mean vector' (MV-GR-M) and the 'Multivariate Modified Group Runs control chart for Mean vector' (MV-MGR-M) charts.

Keywords and Phrases: Average Time to Signal (ATS), Zero State, Steady State, Unit and Group Runs (UGR) control charts

1. INTRODUCTION

Since 1947, various multivariate procedures have been developed for simultaneous monitoring of the two or more quality characteristics. Some of the control charts are developed to detect shifts in the mean vector and the covariance matrix. These charts assumes the data follows p-variate normal

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