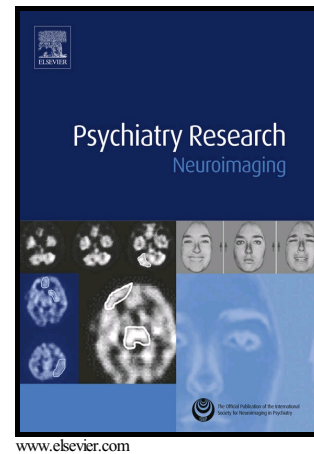


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# Functional network abnormalities consistent with behavioral profile in Autism Spectrum Disorder

René Besseling<sup>\*a,b</sup>, Rolf Lamerichs<sup>a,c</sup>, Britt Michels<sup>d</sup>, Stephan Heunis<sup>a,b</sup>, Anton de Louw<sup>a,b</sup>, Anton Tjihuis<sup>a</sup>, Jan Bergmans<sup>a</sup>, Bert Aldenkamp<sup>a,b,e,f</sup>

<sup>a</sup>Department of Electrical Engineering, Eindhoven University of Technology, the Netherlands

<sup>b</sup>Academic Center for Epileptology Kempenhaeghe, Heeze, the Netherlands

<sup>c</sup>Philips Research, Eindhoven, the Netherlands

<sup>d</sup>Department of Biomedical Engineering, Eindhoven University of Technology, the Netherlands

<sup>e</sup>Ghent University Hospital, Ghent, Belgium

<sup>f</sup>Maastricht University Hospital, Maastricht, the Netherlands

\*Corresponding author; e-mail [r.m.h.besseling@tue.nl](mailto:r.m.h.besseling@tue.nl); tel +31653452597

## Abstract

Autism spectrum disorder (ASD) is a neurodevelopmental disorder in which the severity of symptoms varies over subjects. The iCAPs model (innovation-driven co-activation patterns) is a recently developed spatio-temporal model to describe fMRI data. In this study, the iCAPs model was employed to find functional imaging biomarkers for ASD in resting-state fMRI data.

MRI data from 125 ASD patients and 243 healthy controls was selected from the online ABIDE data repository. Following standard fMRI preprocessing steps, the iCAP patterns were fitted to the data to obtain network time series. Furthermore, specific combinations of iCAPs were mapped to behavioral domain time series. To quantify to which extent the time series contribute to the fMRI dynamics, their (temporal) standard deviation was calculated and compared between patients and controls.

Abnormalities were found in networks involving subcortical and limbic areas and default mode network regions. When mapping the network dynamics to behavioral domain time series, abnormalities were found in emotional and visual behavioral subdomains, and within the ASD spectrum were more pronounced in subjects with autism compared to Asperger's syndrome. Also a trend towards impairment in networks facilitating social cognition was found. The functional imaging abnormalities are consistent with the behavioral impairments typical for ASD.

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