Document Control Sheet

1. ISBN or ISSN	2. type of document (e.g. report, publication) Final report
3. title Stellar spin-down: does the magnetic dynamo have an expiration date? (XMM-Newton Large Program)	
4. author(s) (family name, first name(s)) Poppenhaeger, K.	5. end of project 30.06.2025
	6. publication date
	7. form of publication
8. performing organization(s) (name, address) Leibniz-Institut für Astrophysik Potsdam (AIP) An der Sternwarte 16 14482 Potsdam	9. originator's report no.
	10. reference no. 50 OR 2312
	11. no. of pages 9
12. sponsoring agency (name, address) Deutsche Raumfahrtagentur im Deutschen Zentrum für Luft- und Raumfahrt e.V. Königswinterer Str. 522-524 53227 Bonn	13. no. of references
	14. no. of tables
	15. no. of figures
16. supplementary notes	
17. presented at (title, place, date)	

18. abstract

The project "Stellar spin-down: does the magnetic dynamo have an expiration date?" investigated whether the magnetic activity of sun-like stars decreases significantly or collapses completely in late evolutionary stages. It was based on new observations of six old sun-like stars with *XMM-Newton*, which were acquired as part of an international Large Program. The project developed a specialized data processing pipeline that corrects for remaining detector artifacts in the ultra-soft energy range (150–200 eV), enabling more precise analysis of weak X-ray sources. Four stars were clearly detected, and two provided meaningful upper limits. The results show that old sun-like stars exhibit an unexpectedly complex relationship between rotation and magnetic activity that goes beyond the previous concept of "weakened magnetic braking." The project thus provided new insights into the late evolution of stellar dynamos and at the same time improved the methodological foundations of X-ray data analysis.

19. keywords	
20. publisher	21. price