A MIDDLE TRIASSIC $^{40}Ar/^{39}Ar$ AGE FOR THE PAASSELKÄ IMPACT STRUCTURE (FINLAND). M. Schmieder[1], E. Buchner[1], W. H. Schwarz[2], M. Trieloff[2], J. Moilanen[3] and T. Öhman[4]. [1]Institut für Planetologie, Universität Stuttgart, D-70174 Stuttgart, Germany. Email: martin.schmieder@geologie.uni-stuttgart.de. [2]Institut für Geowissenschaften, Universität Heidelberg, D-69120 Heidelberg. [3]Pinkelikatu 6 B 48, FI-90520 Oulu, Finland. [4]Department of Geosciences, FI-90014 University of Oulu, Finland

Introduction: Among the eleven impact structures currently known in Finland, the ~10 km Paasselkä impact structure is the third largest. As no isotopic data have been available so far, former impact age estimations were only constrained by the ~1.9 Ga Paleoproterozoic crystalline target rocks [1,2]. Due to the presence of shock-molten sandstones in impact melt rocks, the impact age was recently revised to <1.4 Ga [3]. Here we present the first $^{40}Ar/^{39}Ar$ age data for the Paasselkä impact structure.

Samples and Analytical Procedure: ~130 mg of optically fresh recrystallized feldspar glass particles separated from clast-rich impact melt rocks (see [2] for detailed description) were chosen for isotopic dating. $^{40}Ar/^{39}Ar$ step-heating analysis was carried out at the University of Heidelberg [4,5].

Results and Interpretation: $^{40}Ar/^{39}Ar$ step-heating analysis yielded a Middle Triassic partial plateau age of 229 ± 3 Ma (2σ; MSWD=1.01; *P*=0.42) for ~53-100% of the ^{39}Ar released during the 9 final heating steps, with ages of individual extractions that overlap within the 2σ error limit. The age spectrum exhibits younger apparent ages in the low-temperature extraction steps (~0-9% of ^{39}Ar released), probably due to argon redistribution and argon loss via recrystallization or alteration. Some fractions (~9-53% of ^{39}Ar) show older apparent ages that form a hump-shaped spectrum suggestive of argon recoil redistribution and/or argon inherited from incompletely degassed K-rich phases of the older target rocks (e.g., [6,7]). The inverse isochron plot yielded a $^{36}Ar/^{40}Ar$ intercept value of ~0.0035. The K/Ca ratio over the partial plateau is variable, likely due to the mixed 'ternary' composition of recrystallized feldspar glass particles in the Paasselkä impact melt rocks [2]. With regard to the criteria for defining plateaux in $^{40}Ar/^{39}Ar$ geochronology [6], the new partial plateau age should be considered as a preliminary *preferred* Paasselkä impact age. However, this age value is very close to the slightly older 236 ± 2 Ma (2σ) integrated age of the separate. Further refining of the Paasselkä impact age might be desirable. The new 229 ± 3 Ma preferred $^{40}Ar/^{39}Ar$ age for the Paasselkä impact structure is, within uncertainty, coeval with the recently reported 235 ± 6 Ma zircon and 232 ± 7 Ma apatite (U-Th)/He ages for the Lake St. Martin impact structure in Canada [8].

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