

# Correction to: Trio of super-Earth candidates orbiting K-dwarf HD 48948: a new habitable zone candidate

by S. Dalal<sup>1</sup>,<sup>\*</sup> F. Rescigno<sup>1</sup>, M. Cretignier<sup>2</sup>, A. Anna John<sup>3</sup>, F. Z. Majidi<sup>4,5,6</sup>, L. Malavolta<sup>4,5</sup>, A. Mortier<sup>7</sup>, M. Pinamonti<sup>5</sup>, L. A. Buchhave<sup>8</sup>, R. D. Haywood,<sup>1†</sup> A. Sozzetti<sup>5</sup>, X. Dumusque,<sup>9</sup> F. Lienhard,<sup>10</sup> K. Rice,<sup>11,12</sup> A. Vanderburg,<sup>13</sup> B. Lakeland,<sup>1</sup> A. S. Bonomo,<sup>5</sup> A. Collier Cameron,<sup>4,14</sup> M. Damasso,<sup>5</sup> L. Affer,<sup>15</sup> W. Boschin,<sup>16,17,18</sup> B. Cooke,<sup>19,20</sup> R. Cosentino,<sup>18</sup> L. Di Fabrizio,<sup>16</sup> A. Ghedina,<sup>16</sup> A. Harutyunyan,<sup>16</sup> D. W. Latham,<sup>21</sup> M. López-Morales,<sup>21</sup> C. Lovis,<sup>9</sup> A. F. Martínez Fiorenzano,<sup>16</sup> M. Mayor,<sup>9</sup> B. Nicholson,<sup>22</sup> F. Pepe,<sup>9</sup> M. Stalport,<sup>23,24</sup> S. Udry,<sup>9</sup> C. A. Watson<sup>25</sup> and T. G. Wilson<sup>4,14</sup>

<sup>1</sup>Department of Astrophysics, University of Exeter, Stocker Rd, Exeter EX4 4QL, UK

<sup>2</sup>Department of Physics, University of Oxford, OX13RH Oxford, UK

<sup>3</sup>SUPA, School of Physics & Astronomy, University of St Andrews, North Haugh, St Andrews KY169SS, UK

<sup>4</sup>Dipartimento di Fisica e Astronomia ‘Galileo Galilei’ – Università degli Studi di Padova, Vicolo dell’Osservatorio 3, I-35122 Padova, Italy

<sup>5</sup>INAF - Osservatorio Astrofisico di Torino, via Osservatorio 20, I-10025 Pino Torinese, Italy

<sup>6</sup>Blue Skies Space, Italia SRL, via Vincenzo Monti 16, I-20123 Milano, Italy

<sup>7</sup>Department of Astrophysics, University of Birmingham, Edgbaston, Birmingham B15 2TT, UK

<sup>8</sup>DTU Space, Technical University of Denmark, Elektrovej 328, DK-2800 Kgs. Lyngby, Denmark

<sup>9</sup>Observatoire de Genève, Université de Genève, Chemin Pegasi, 51, CH-1290 Versoix, Switzerland

<sup>10</sup>Astrophysics Group, Cavendish Laboratory, University of Cambridge, J.J. Thomson Avenue, Cambridge CB3 0HE, UK

<sup>11</sup>SUPA, Institute for Astronomy, The Royal Observatory, University of Edinburgh, Blackford Hill, Edinburgh EH9 3HJ, UK

<sup>12</sup>Centre for Exoplanet Science, University of Edinburgh, Edinburgh EH9 3FD, UK

<sup>13</sup>Kavli Institute for Astrophysics and Space Research, Massachusetts Institute of Technology, 77 Massachusetts Avenue, Cambridge, MA 02139, USA

<sup>14</sup>Centre for Exoplanet Science, University of St Andrews, North Haugh, St Andrews, KY169SS, UK

<sup>15</sup>INAF – Osservatorio Astronomico di Palermo, Piazza del Parlamento, 1, I-90134, Palermo, Italy

<sup>16</sup>Fundación Galileo Galilei – INAF (Telescopio Nazionale Galileo), Rambla J. A. F. Perez 7, E-38712 Breña Baja (La Palma), Canary Islands, Spain

<sup>17</sup>Instituto de Astrofísica de Canarias, C/Vía Láctea s/n, E-38205 La Laguna (Tenerife), Canary Islands, Spain

<sup>18</sup>Departamento de Astrofísica, Universidad de La Laguna, Av. del Astrofísico Francisco Sánchez s/n, E-38205 La Laguna (Tenerife), Canary Islands, Spain

<sup>19</sup>Centre for Exoplanets and Habitability, University of Warwick, Gibbet Hill Road, Coventry CV4 7AL, UK

<sup>20</sup>Department of Physics, University of Warwick, Gibbet Hill Road, Coventry CV4 7AL, UK

<sup>21</sup>Center for Astrophysics, Harvard & Smithsonian, 60 Garden Street, Cambridge, MA 02138, USA

<sup>22</sup>Centre for Astrophysics, University Of Southern Queensland, West Str, Toowoomba, QLD 4350, Australia

<sup>23</sup>Space sciences, Technologies and Astrophysics Research (STAR) Institute, Université de Liège, Allée du Six-Août 19C, B-4000, Liège, Belgium

<sup>24</sup>Astrobiology Research Unit, Université de Liège, Allée du 6 Août 19C, B-4000 Liège, Belgium

<sup>25</sup>Astrophysics Research Centre, Queen’s University Belfast, Belfast BT7 1NN, UK

**Key words:** errata, addenda – techniques: radial velocities – planets and satellites: detection – stars: activity – methods: statistical – stars: rotation – instrumentation: spectrographs.

This is an erratum to the paper titled ‘Trio of super-Earth candidates orbiting K-Dwarf HD 48948: a new habitable zone candidate’, published in MNRAS 531, 4464–4481 (2024) with <https://doi.org/10.1093/mnras/stae1367>. We have identified and corrected errors in table 3 of the original publication. The incident flux and

temperature values for the three planetary candidates were incorrectly calculated due to a mathematical error. Additionally, we discovered a typographical mistake in the eccentricity values for candidates c and d in the TWEAKS analysis. The accurate and updated values are provided in the Table 1. While these errors do not alter the overall conclusions of the paper, the corrected values provide a more accurate representation of the data and should be used for reference in future research.

\* E-mail: [s.dalal@exeter.ac.uk](mailto:s.dalal@exeter.ac.uk)

† STFC Ernest Rutherford Fellow

**Table 1.** The table displays the results of three Keplerian models, as discussed in sections 7.1, 7.2, and 7.3. The values and uncertainties of each parameter are derived from their respective posterior distributions, with the 50<sup>th</sup> percentile representing the central value and the 16<sup>th</sup> to 84<sup>th</sup> percentile range indicating 1 $\sigma$  uncertainty. Additionally, the derived parameters, as explained in section 7.3, are also included in this table. The maximum equilibrium temperature is calculated assuming an albedo ( $A_B$ ) of 0 and isotropic re-emission and uniform equilibrium temperature.

Parameter	Symbol	Unit	HD48948 b	HD48948 c	HD48948 d
<b>Three Keplerians-only analysis on YV2 RVs</b>					
Orbital period	$P$	days	$7.33982^{+0.00082}_{-0.00085}$	$37.998^{+0.018}_{-0.019}$	$151.12^{+0.56}_{-0.49}$
RV amplitude	$K$	$\text{m s}^{-1}$	$1.35^{+0.18}_{-0.17}$	$1.71^{+0.20}_{-0.22}$	$1.09 \pm 0.19$
Eccentricity	$e$		$0.06^{+0.10}_{-0.05}$	$0.06^{+0.09}_{-0.05}$	$0.10^{+0.18}_{-0.09}$
Argument of periastron	$\omega$	rad	$0.83^{+1.27}_{-1.28}$	$-1.06^{+1.24}_{-1.00}$	$-1.02^{+1.43}_{-1.11}$
	$\sqrt{e} \cos \omega$		$0.07^{+0.19}_{-0.16}$	$0.04^{+0.15}_{-0.20}$	$0.04^{+0.17}_{-0.30}$
	$\sqrt{e} \sin \omega$		$0.09^{+0.20}_{-0.15}$	$-0.11^{+0.13}_{-0.19}$	$-0.14^{+0.18}_{-0.27}$
Time of periastron	$t_p$	BJD	$2456574.05^{+1.53}_{-1.49}$	$2456570.22^{+5.98}_{-7.11}$	$2456564.06^{+18.67}_{-31.89}$
Minimum mass	$m \sin(i)$	$M_{\oplus}$	$3.18 \pm 0.41$	$6.97^{+0.82}_{-0.89}$	$6.93^{+1.21}_{-1.24}$
<b>One-dimensional GP analysis on YVA RVs</b>					
Orbital period	$P$	days	$7.34012^{+0.00052}_{-0.00046}$	$37.99^{+0.16}_{-0.22}$	$150.28 \pm 0.69$
RV amplitude	$K$	$\text{m s}^{-1}$	$2.07^{+0.15}_{-0.17}$	$1.06 \pm 0.69$	$1.55^{+0.35}_{-0.38}$
Eccentricity	$e$		$0.08^{+0.06}_{-0.05}$	$0.23^{+0.14}_{-0.19}$	$0.15^{+0.17}_{-0.10}$
Argument of periastron	$\omega$	rad	$0.55^{+0.95}_{-0.92}$	$-0.48^{+1.81}_{-1.40}$	$-1.05 - 0.79^{+0.96}$
	$\sqrt{e} \cos \omega$		$0.16^{+0.13}_{-0.18}$	$0.13^{+0.34}_{-0.40}$	$0.10^{+0.20}_{-0.33}$
	$\sqrt{e} \sin \omega$		$0.11^{+0.14}_{-0.18}$	$-0.11^{+0.46}_{-0.33}$	$-0.25^{+0.23}_{-0.20}$
Time of periastron	$t_p$	BJD	$2456573.74^{+1.05}_{-0.87}$	$2456571.71^{+10.5}_{-9.80}$	$2456571.52 \pm 15.3$
Minimum mass	$m \sin(i)$	$M_{\oplus}$	$4.86^{+0.35}_{-0.39}$	$3.94^{+3.02}_{-2.85}$	$9.72^{+2.26}_{-2.56}$
<b>Multidimensional GP analysis on YVA RVs</b>					
Orbital period	$P$	days	$7.34013^{+0.00040}_{-0.00040}$	$37.920^{+0.026}_{-0.024}$	$150.95^{+0.45}_{-0.41}$
RV amplitude	$K$	$\text{m s}^{-1}$	$2.11 \pm 0.13$	$1.75 \pm 0.25$	$1.72 \pm 0.22$
Eccentricity	$e$		$0.078^{+0.058}_{-0.050}$	$0.22^{+0.10}_{-0.11}$	$0.12^{+0.12}_{-0.08}$
Argument of periastron	$\omega$	rad	$0.68^{+0.84}_{-0.77}$	$1.76^{+0.66}_{-0.54}$	$4.69^{+1.19}_{-1.21}$
	$\sqrt{e} \cos \omega$		$0.17^{+0.13}_{-0.18}$	$-0.08^{+0.23}_{-0.22}$	$0.01 \pm 0.24$
	$\sqrt{e} \sin \omega$		$0.14^{+0.13}_{-0.17}$	$0.41^{+0.13}_{-0.21}$	$0.21^{+0.25}_{-0.19}$
Time of periastron	$t_p$	BJD	$2459003.44^{+1.06}_{-0.83}$	$2459019.8^{+3.5}_{-2.7}$	$2459107^{+24}_{-42}$
Minimum mass	$m \sin(i)$	$M_{\oplus}$	$4.96 \pm 0.32$	$6.9 \pm 1.0$	$11.0 \pm 1.5$
<b>TWEAKS analysis on TWEAKS RVs</b>					
Orbital period	$P$	days	$7.34013 \pm 0.00040$	$38.06 \pm 0.06$	$151.92 \pm 0.44$
RV amplitude	$K$	$\text{m s}^{-1}$	$2.28 \pm 0.15$	$1.48 \pm 0.39$	$1.55 \pm 0.34$
Eccentricity	$e$		$0.055 \pm 0.043$	$0.11 \pm 0.08$	$0.13 \pm 0.11$
Argument of periastron	$\omega$	rad	$0.68^{+0.84}_{-0.77}$	$1.76^{+0.66}_{-0.54}$	$4.69^{+1.19}_{-1.21}$
Time of periastron	$t_p$	BJD	$2456567.026 \pm 1.72$	$2456557.14 \pm 12.5$	$2456494.34 \pm 20.1$
Minimum mass	$m \sin(i)$	$M_{\oplus}$	$5.43 \pm 0.30$	$6.33 \pm 1.6$	$10.05 \pm 2.27$
<b>Derived parameters</b>					
Semimajor axis	$a$	au	$0.0652 \pm 0.0005$	$0.1951 \pm 0.0016$	$0.4894 \pm 0.0042$
Semimajor axis	$a$	arcsec	0.0039	0.0116	0.0291
Scaled semimajor axis	$a/R_{\star}$		$20.65 \pm 0.21$	$61.79 \pm 0.62$	$154.97 \pm 1.61$
Incident flux	$F_{\text{inc}}$	$F_{\text{inc}, \oplus}$	$43.33 \pm 2.41$	$4.84 \pm 0.27$	$0.77 \pm 0.04$
Equilibrium temperature	$T_{\text{eq}}$	K	$715 \pm 10$	$413 \pm 6$	$261 \pm 4$

This paper has been typeset from a  $\text{\LaTeX}$  file prepared by the author.