

**Supplementary Table S2. Linear regression model analyzing the association of corneal front and back surface aberrations of the different gestational age groups and ROP adjusted for age at examination and sex.**

| Linear regression model                                 | GA ≥ 37 wks | GA 29-32 wks          |         | GA ≤ 28 wks           |         | ROP (yes)             |         |
|---|-------------|-----------------------|---------|-----------------------|---------|-----------------------|---------|
|   | Ref.        | B [95% CI]            | P-value | B [95% CI]            | P-value | B [95% CI]            | P-value |
| <b>N = 485</b>  |             |                       |         |                       |         |                       |         |
| <b>CORNEAL FRONT SURFACE</b>                            |             |                       |         |                       |         |                       |         |
| <b>Astigmatism</b>                                      |             |                       |         |                       |         |                       |         |
| Oblique (Z <sup>2</sup> <sub>-2</sub> )                 |             | 0.11 [0.03; 0.19]     | 0.009   | 0.12 [0.01; 0.22]     | 0.041   | -0.03 [-0.16; 0.11]   | 0.69    |
| Vertical (Z <sup>2</sup> <sub>2</sub> )                 |             | 0.02 [-0.09; 0.14]    | 0.69    | -0.08 [-0.24; 0.07]   | 0.30    | 0.22 [0.03; 0.41]     | 0.025   |
| <b>Coma</b>   |             |                       |         |                       |         |                       |         |
| Horizontal (Z <sup>3</sup> <sub>1</sub> )               |             | -0.002 [-0.04; 0.04]  | 0.93    | -0.01 [-0.07; 0.04]   | 0.65    | -0.03 [-0.10; 0.04]   | 0.38    |
| Vertical (Z <sup>3</sup> <sub>-1</sub> )                |             | 0.03 [-0.004; 0.07]   | 0.08    | 0.12 [0.07; 0.17]     | <0.001  | -0.03 [-0.09; 0.03]   | 0.31    |
| <b>Trefoil</b>  |             |                       |         |                       |         |                       |         |
| Oblique (Z <sup>3</sup> <sub>3</sub> )                  |             | 0.01 [-0.01; 0.04]    | 0.32    | 0.03 [-0.01; 0.06]    | 0.15    | -0.01 [-0.06; 0.03]   | 0.15    |
| Vertical (Z <sup>3</sup> <sub>-3</sub> )                |             | 0.001 [-0.03; 0.03]   | 0.91    | -0.04 [-0.07; -0.001] | 0.042   | 0.05 [0.003; 0.09]    | 0.036   |
| <b>Spherical aberration (Z<sup>4</sup><sub>0</sub>)</b> |             | 0.01 [-0.01; 0.03]    | 0.36    | -0.003 [-0.03; 0.02]  | 0.79    | -0.01 [-0.03; 0.02]   | 0.73    |
| <b>Higher-order aberrations (RMS)</b>                   |             |                       |         |                       |         |                       |         |
| Total   |             | 0.09 [-0.01; 0.19]    | 0.09    | 0.25 [0.11; 0.38]     | <0.001  | 0.03 [-0.13; 0.20]    | 0.69    |
| Higher-order aberrations (HOA)                          |             | 0.02 [-0.02; 0.05]    | 0.32    | 0.08 [0.03; 0.12]     | 0.001   | 0.04 [-0.02; 0.09]    | 0.19    |
| Lower-order aberrations (LOA)                           |             | 0.09 [-0.01; 0.19]    | 0.08    | 0.23 [0.10; 0.37]     | 0.001   | 0.02 [-0.14; 0.18]    | 0.83    |
| <b>CORNEAL BACK SURFACE</b>                             |             |                       |         |                       |         |                       |         |
| <b>Astigmatism</b>                                      |             |                       |         |                       |         |                       |         |
| Oblique (Z <sup>2</sup> <sub>-2</sub> )                 |             | -0.01 [-0.05; 0.02]   | 0.45    | -0.02 [-0.06; 0.03]   | 0.51    | 0.01 [-0.05; 0.07]    | 0.71    |
| Vertical (Z <sup>2</sup> <sub>2</sub> )                 |             | -0.05 [-0.09; -0.01]  | 0.010   | -0.06 [-0.11; -0.01]  | 0.028   | -0.04 [-0.11; 0.02]   | 0.18    |
| <b>Coma</b>   |             |                       |         |                       |         |                       |         |
| Horizontal (Z <sup>3</sup> <sub>1</sub> )               |             | 0.01 [0.001; 0.02]    | 0.026   | 0.003 [-0.01; 0.02]   | 0.67    | 0.01 [-0.01; 0.02]    | 0.41    |
| Vertical (Z <sup>3</sup> <sub>-1</sub> )                |             | -0.002 [-0.01; 0.01]  | 0.61    | -0.01 [-0.02; 0.003]  | 0.16    | -0.004 [-0.02; 0.01]  | 0.59    |
| <b>Trefoil</b>  |             |                       |         |                       |         |                       |         |
| Oblique (Z <sup>3</sup> <sub>3</sub> )                  |             | 0.01 [-0.01; 0.03]    | 0.27    | -0.03 [-0.06; -0.004] | 0.023   | -0.01 [-0.04; 0.02]   | 0.48    |
| Vertical (Z <sup>3</sup> <sub>-3</sub> )                |             | 0.01 [-0.02; 0.03]    | 0.50    | -0.003 [-0.04; 0.03]  | 0.88    | -0.02 [-0.06; 0.02]   | 0.43    |
| <b>Spherical aberration (Z<sup>4</sup><sub>0</sub>)</b> |             | -0.004 [-0.01; 0.002] | 0.17    | -0.001 [-0.01; 0.01]  | 0.79    | -0.01 [-0.02; -0.001] | 0.037   |
| <b>Higher-order aberrations (RMS)</b>                   |             |                       |         |                       |         |                       |         |
| Total   |             | -0.002 [-0.05; 0.04]  | 0.95    | 0.02 [-0.04; 0.08]    | 0.54    | 0.04 [-0.03; 0.11]    | 0.25    |
| Higher-order aberrations (HOA)                          |             | 0.004 [-0.02; 0.02]   | 0.70    | 0.03 [0.003; 0.05]    | 0.03    | 0.05 [0.02; 0.08]     | 0.002   |
| Lower-order aberrations (LOA)                           |             | -0.01 [-0.05; 0.03]   | 0.59    | 0.02 [-0.03; 0.07]    | 0.39    | 0.08 [0.02; 0.14]     | 0.006   |

Corneal aberration values were compared in a multivariable linear regression model per corneal aberration type, including this as a depending variable and gestational age in the groups (full-term infants (GA ≥ 37 weeks), GA 29-32 weeks, GA ≤ 28 weeks) and ROP occurrence (yes/no) as independent variables, adjusted for sex and age at examination. The non-standardized coefficient B and 95% confidence interval were calculated. Only data of the right eye were included in the analysis. Z - Zernicke, ROP – retinopathy of prematurity,