Simplified overall GP expression

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- 0.0001804\*x(1)^2\*x(2) + 0.003846\*x(1)^2 - 0.02163\*x(1)\*x(2)^2 + 0.0000902\*x(1)\*x(2)\*x(3) + 0.0006395\*x(1)\*x(2)\*x(4) + 0.2426\*x(1)\*x(2) - 0.0006343\*x(1)\*x(3) - 0.003974\*x(1)\*x(4)-0.2565\*x(1) - 0.00007464\*x(2)\*x(3)\*x(4) - 0.003868\*x(2)\*x(3) - 0.0001198\*x(2)\*x(4) - 0.003194\*x(2)\*x(4)+10.2\*x(2) - 0.000002592\*x(3)^2 + 0.0007154\*x(3)\*x(4) - 0.01372\*x(3) + 0.01709\*x(4)+0.4381

Simplified overall GP expression Y8

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0.1708\*x(4) - 13.07\*x(2) - 0.02377\*x(3) - 0.3506\*x(1) + 0.001061\*x(4)\*(x(2) + x(3))+ 0.0005219\*(x(2) - 1.0\*x(4))\*(x(2)+2.0\*x(3)+x(4)) + 0.07021\*x(1)\*x(2) - 0.0002754\*x(1)\*x(3)- 0.003669\*x(1)\*(x(2)^2+x(4)) - 0.0001363\*x(2)^3\*(x(1) + x(4)) + 0.07807\*x(2)^3+0.0003904\*x(1)\*(x(3) + 3.0\*x(4)) + 0.0002754\*x(1)\*x(2)\*x(4) +91.1

AFRP values were analyzed with the Taguchi method, and this method allows to

perform a pair of combinations of tests. In this study, drill point angle, drill diameter,

spindle speed and feed rate were selected. The drill parameters and levels are shown in Table 5. The experiments were conducted according to Taguchi’s L54 Orthogonal I Array, shown in Table 6. The drill diameter, speed, and feed have three levels, and

(21\*33) drill point angle had two levels. In this work, Taguchi’s L54 orthogonal array (21\*33)

was considered, as the L8 array was insufficient to handle the data. In the current study, fifty-four sets of experiments were conducted using standard design matrix of factorial design. Drill parameters concerning thrust and torque forces were measured using S-N ratio.