FEC Polynomials (Clause 91)

Martin Langhammer – Altera
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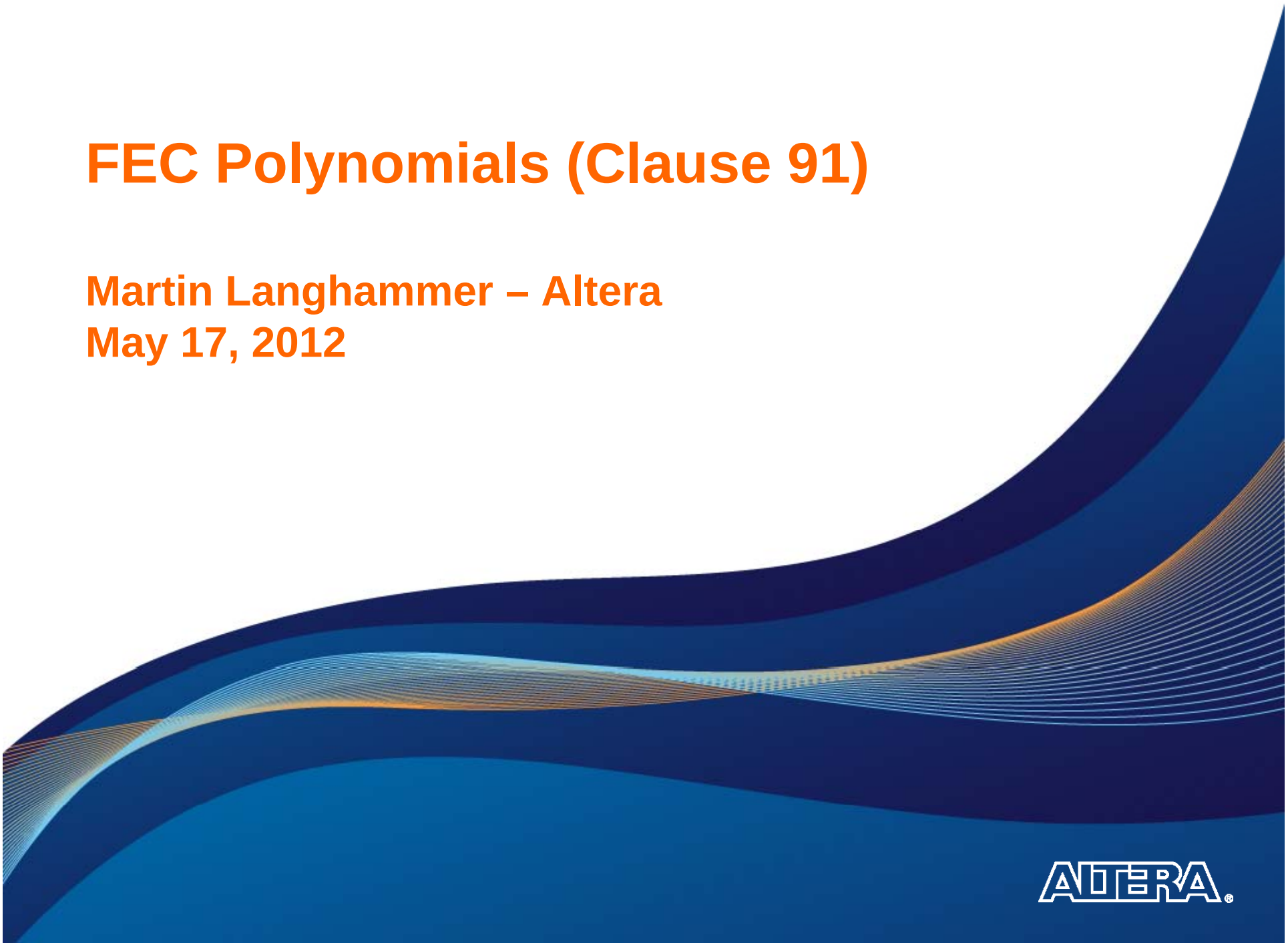

Supporters

- Stephen Bates – PMC Sierra
- Mark Gustlin – Xilinx
- Roy Cideciyan – IBM
- Matt Brown – APM
- Zhongfeng Wang – Broadcom
- Jeff Slavick – Avago Technologies
- Mike Peng Li - Altera

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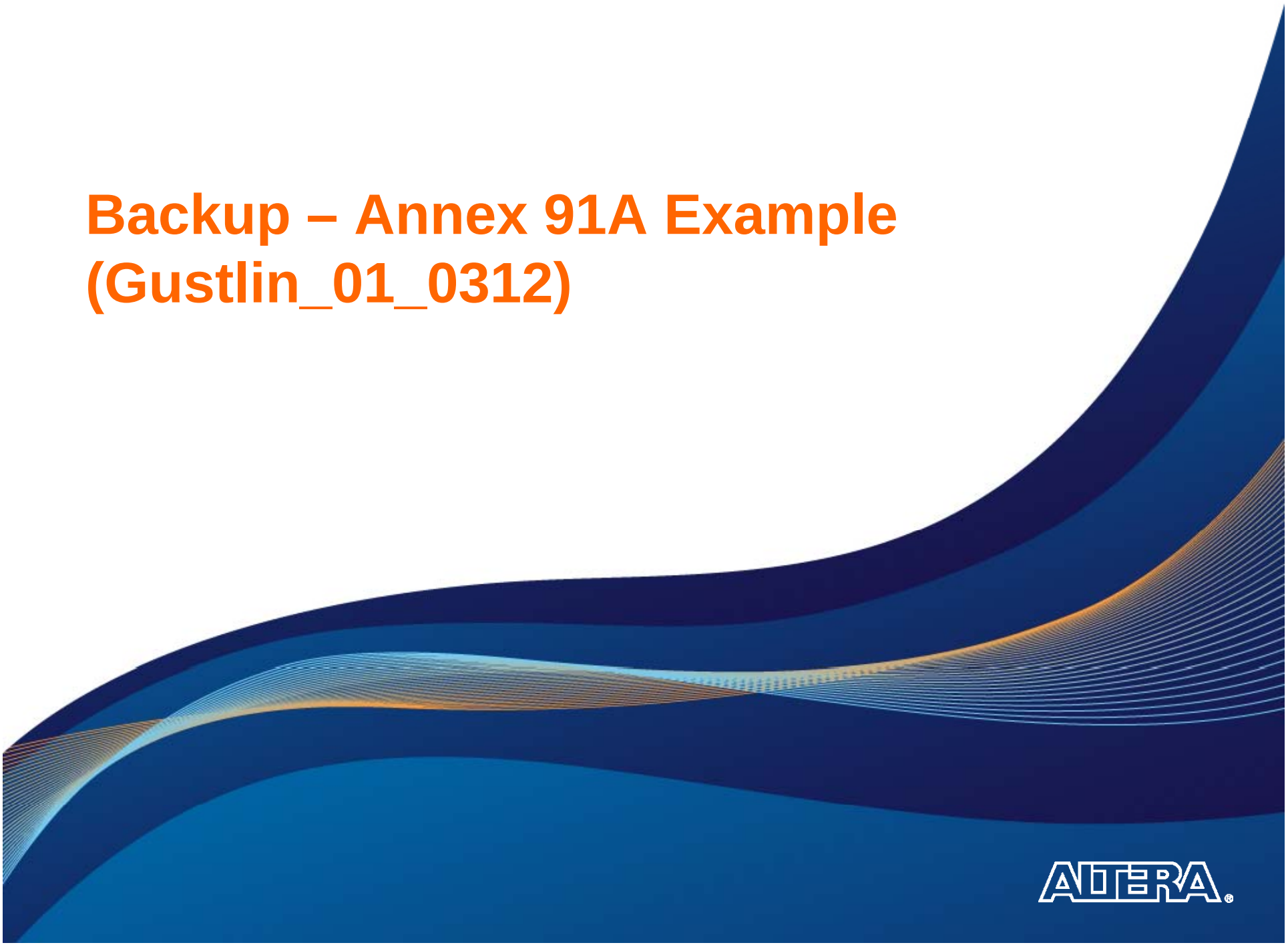
Polynomial Description (91.4.2.9)

- **The codewords shall be systematic. The field polynomial shall be $x^{10}+ x^3+1$. The first root of the generator polynomial shall be 1 (a^0). The generator polynomials and example codewords for both codes are described in Annex 91A.**

Backup – Annex 91A Example (Gustlin_01_0312)



NRZ RS Codeword (528,514,7,10)

- Field Polynomial $g(x) = x^{10} + x^3 + 1$
- Generator Polynomial $G(x) = (x - \alpha^0)(x - \alpha^1)(x - \alpha^2)\ldots(x - \alpha^{13})$
- Generator Polynomial Example
  - Coefficients in reverse order (decimal and hex)

432 290 945 265 592 391 614 900 925 656 32 701 6 904 1

0x1b0 0x122 0x3b1 0x109 0x250 0x187 0x266 0x384 0x39d 0x290 0x20 0x2bd 0x6 0x388 0x1

- Codeword Example
  - k = 514 symbol values from 1023 decremented to 510
  - Followed by (n-k) = 14 check symbols
  - 451 952 674 140 539 287 460 438 559 883 542 885 930 191 decimal
  - 0x1c3 0x3b8 0x2a2 0x8c 0x21b 0x11f 0x1cc 0x1b6 0x22f 0x373 0x21e 0x375 0x3a2 0xbf

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NRZ RS Codeword (528,514,7,10)

- Codeword Example

1023 1022 1021 1020 1019 1018 1017 1016 1015 1014 1013 1012 1011 1010 1009 1008 1007 1006
1005 1004 1003 1002 1001 1000 999 998 997 996 995 994 993 992 991 990 989 988 987 986 985 984
983 982 981 980 979 978 977 976 975 974 973 972 971 970 969 968 967 966 965 964 963 962 961 960
959 958 957 956 955 954 953 952 951 950 949 948 947 946 945 944 943 942 941 940 939 938 937 936
935 934 933 932 931 930 929 928 927 926 925 924 923 922 921 920 919 918 917 916 915 914 913 912
911 910 909 908 907 906 905 904 903 902 901 900 899 898 897 896 895 894 893 892 891 890 889 888
887 886 885 884 883 882 881 880 879 878 877 876 875 874 873 872 871 870 869 868 867 866 865 864
863 862 861 860 859 858 857 856 855 854 853 852 851 850 849 848 847 846 845 844 843 842 841 840
839 838 837 836 835 834 833 832 831 830 829 828 827 826 825 824 823 822 821 820 819 818 817 816
815 814 813 812 811 810 809 808 807 806 805 804 803 802 801 800 799 798 797 796 795 794 793 792
791 790 789 788 787 786 785 784 783 782 781 780 779 778 777 776 775 774 773 772 771 770 769 768
767 766 765 764 763 762 761 760 759 758 757 756 755 754 753 752 751 750 749 748 747 746 745 744
743 742 741 740 739 738 737 736 735 734 733 732 731 730 729 728 727 726 725 724 723 722 721 720
719 718 717 716 715 714 713 712 711 710 709 708 707 706 705 704 703 702 701 700 699 698 697 696
695 694 693 692 691 690 689 688 687 686 685 684 683 682 681 680 679 678 677 676 675 674 673 672
671 670 669 668 667 666 665 664 663 662 661 660 659 658 657 656 655 654 653 652 651 650 649 648
647 646 645 644 643 642 641 640 639 638 637 636 635 634 633 632 631 630 629 628 627 626 625 624
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551 550 549 548 547 546 545 544 543 542 541 540 539 538 537 536 535 534 533 532 531 530 529 528
527 526 525 524 523 522 521 520 519 518 517 516 515 514 513 512 511 510 451 952 674 140 539 287
460 438 559 883 542 885 930 191